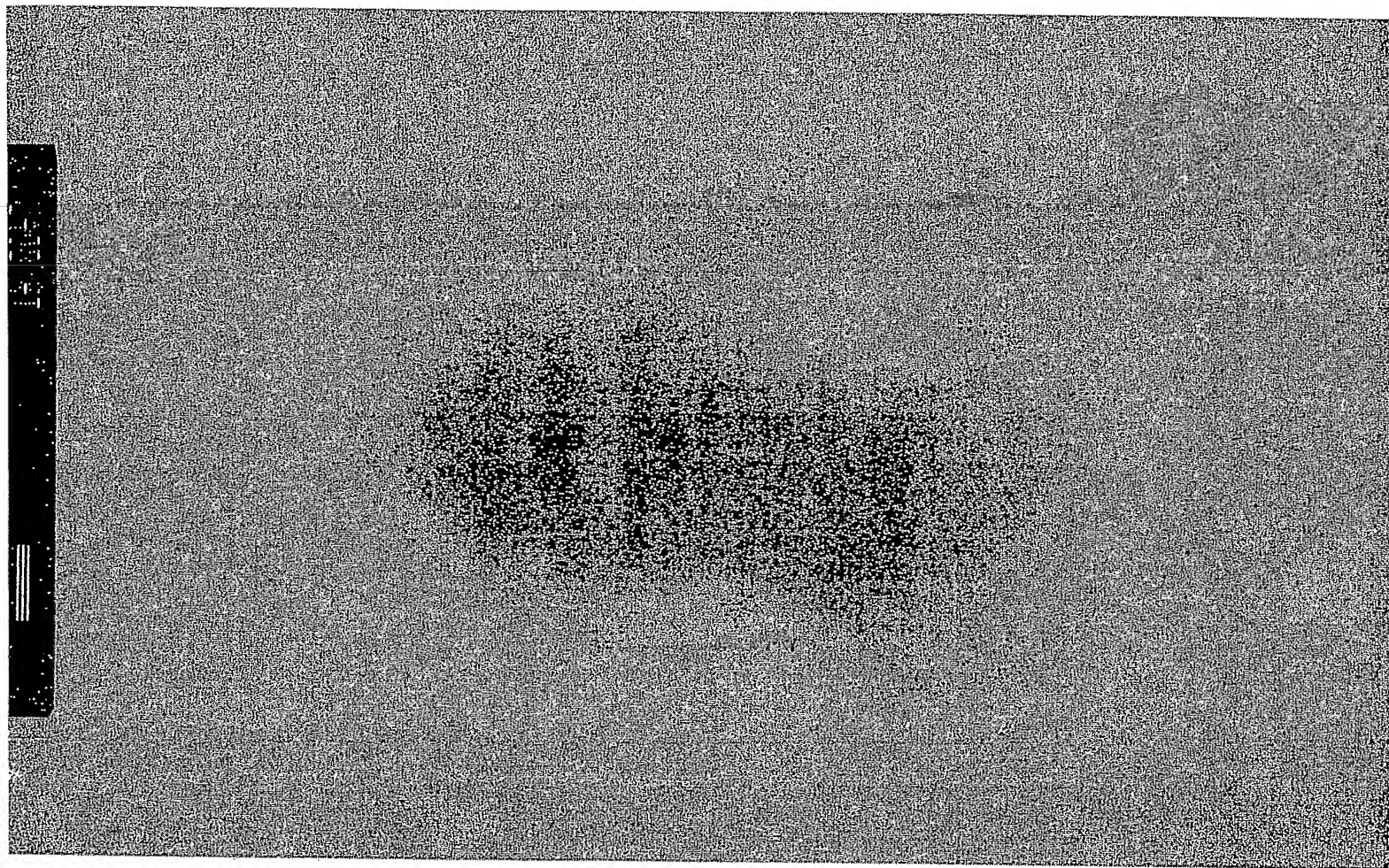
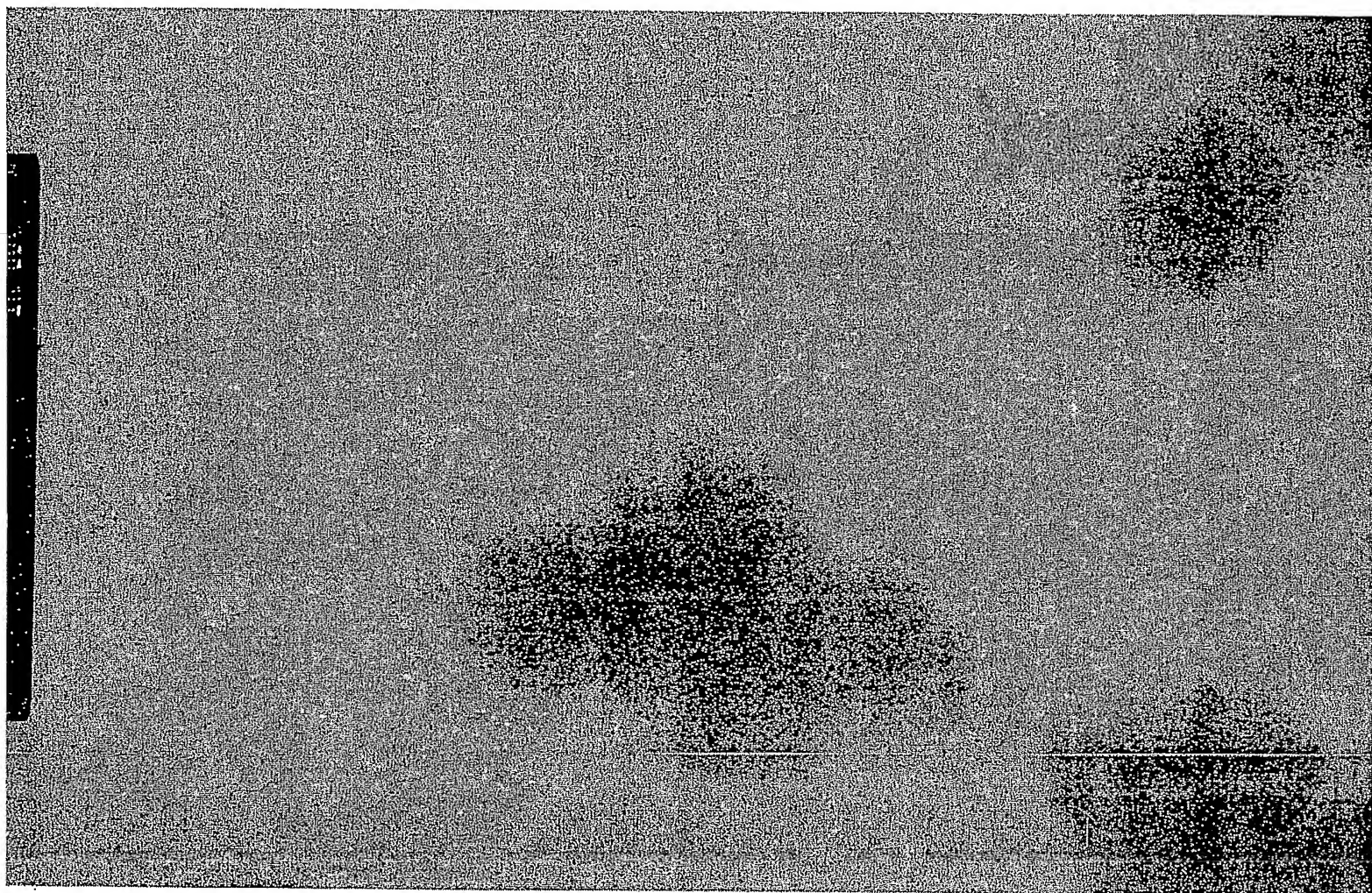


Figure 130



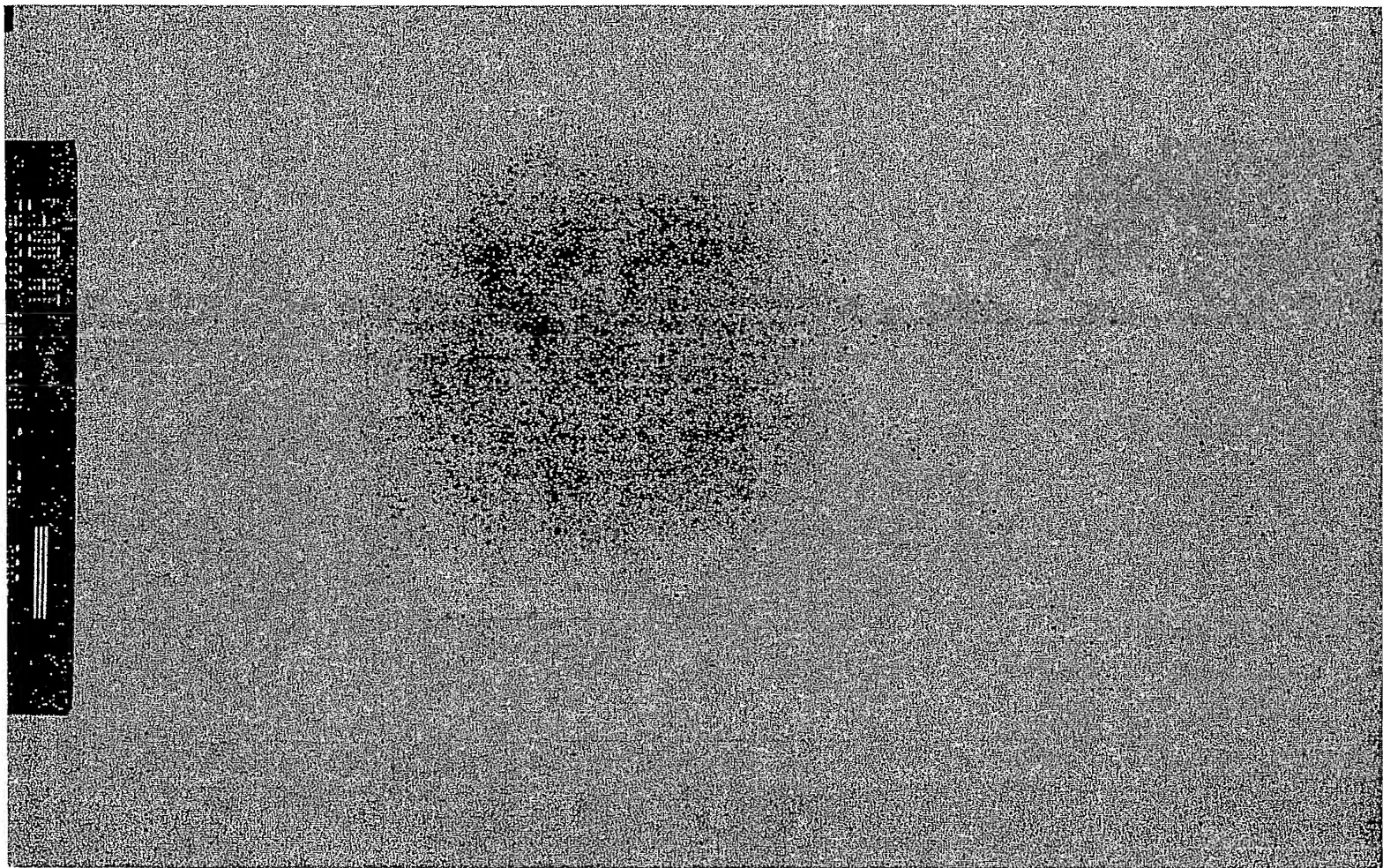
PCT/US05/27239 322/487

Figure 131



323/487

Figure 132



324/487

Figure 133

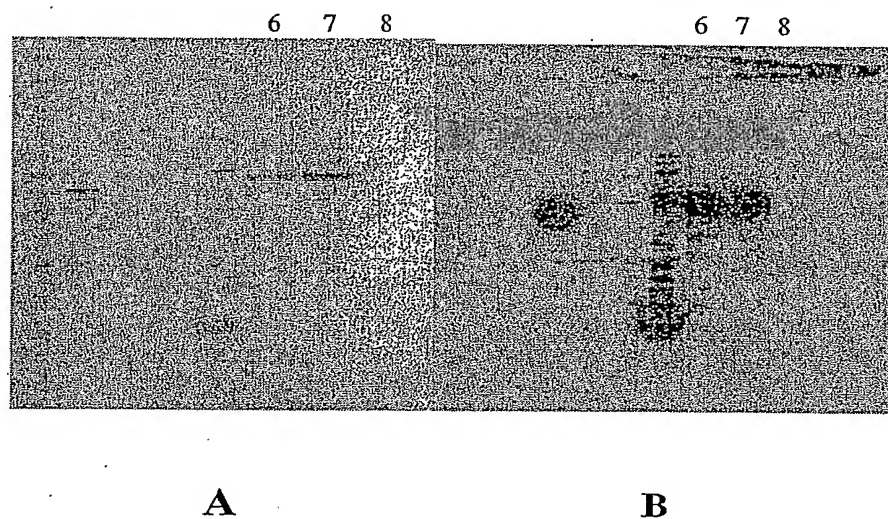


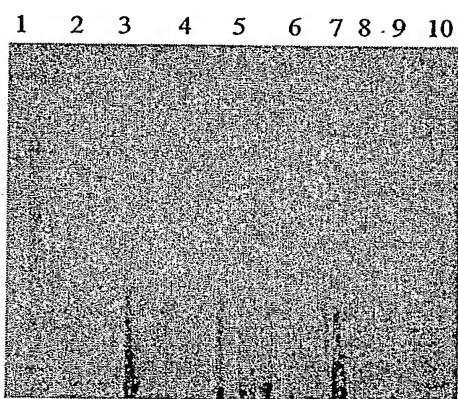
Figure 134

1 2 3 4 5 6 7 8 9 10



PCT/US05/27239 326/487

Figure 135



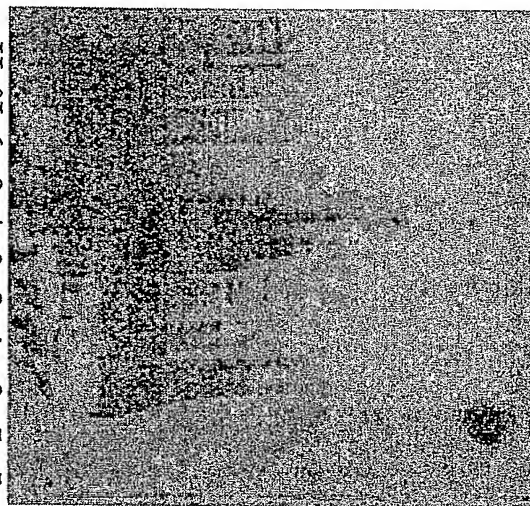
Pilus released by *Lactococcus* sonication

Figure 136A

1. MK
2. GBS 80 (10 ng)
3. L.lactis-A11 starting material (30', 0.2 OD)
4. L.lactis-A11 (not boiled, 0.33 OD)
5. L.lactis-A11 (5', 0.33 OD)
6. L.lactis-A11 (60' d, 0.33 OD)
7. L.lactis-A11 (30', 0.33 OD)
8. Supernatant (not boiled, 2 OD)
9. Supernatant (5', 2 OD)
10. Supernatant (30', 2 OD)
11. Supernatant (60', 2 OD)

SONICATED

starting material	pellet	supernatant
↓		
1 2 3 4	5 6 7 8	9 10 11



α 80

Figure 136B

1. MK
2. L.lactis-A11
3. L.lactis-A11 starting material (30', 0.2 OD)
4. L.lactis-A11 (not boiled, 0.33 OD)
5. L.lactis-A11 (5', 0.33 OD)
6. L.lactis-A11 (60' d, 0.33 OD)
7. L.lactis-A11 (30', 0.33 OD)
8. Supernatant (not boiled, 2 OD)
9. Supernatant (5', 2 OD)
10. Supernatant (30', 2 OD)
11. Supernatant (60', 2 OD)

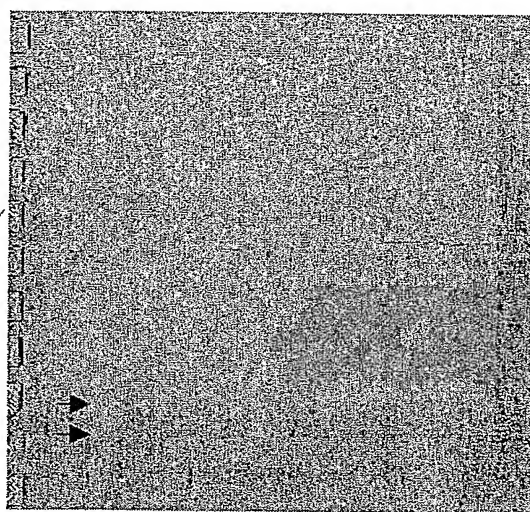




Figure 137

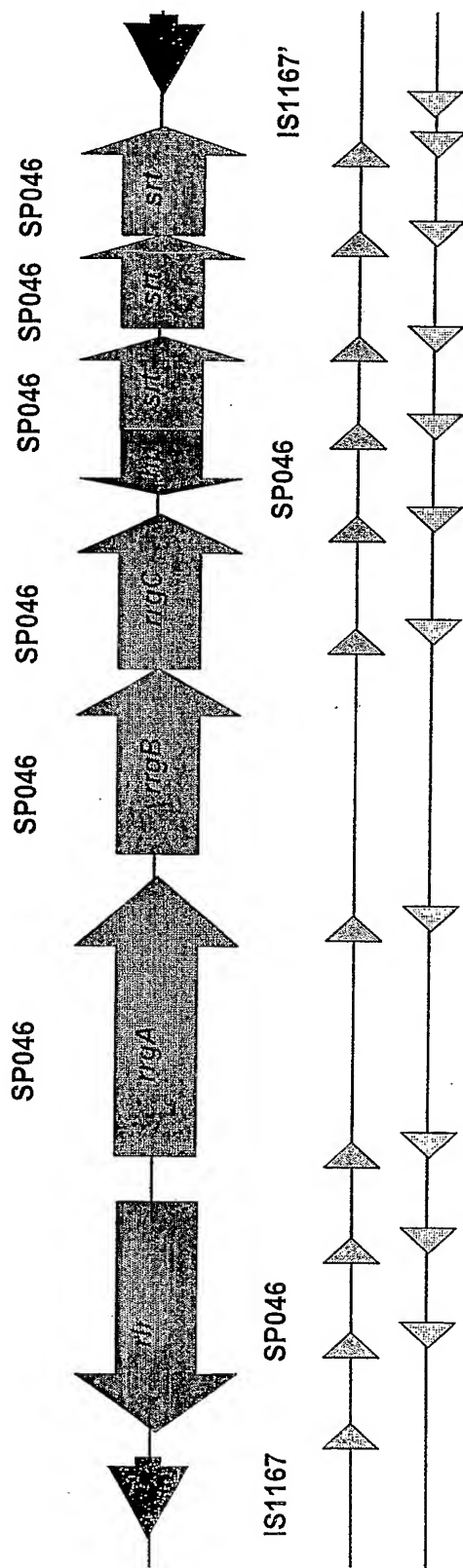
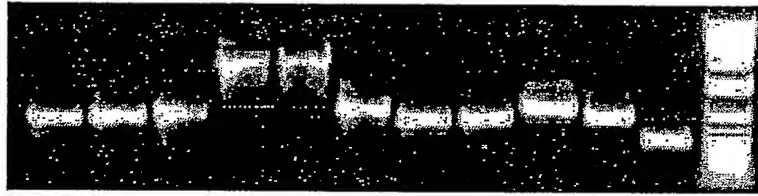


Figure 138

A



TIGR4

B

PCR product	contig_length _TIGR4	overlap
1	754	83
2	759	84
3	847	98
4	2550	99
5	2736	99
6	925	99
7	745	87
8	765	94
9	1008	94
10	802	64
11	461	

Figure 139

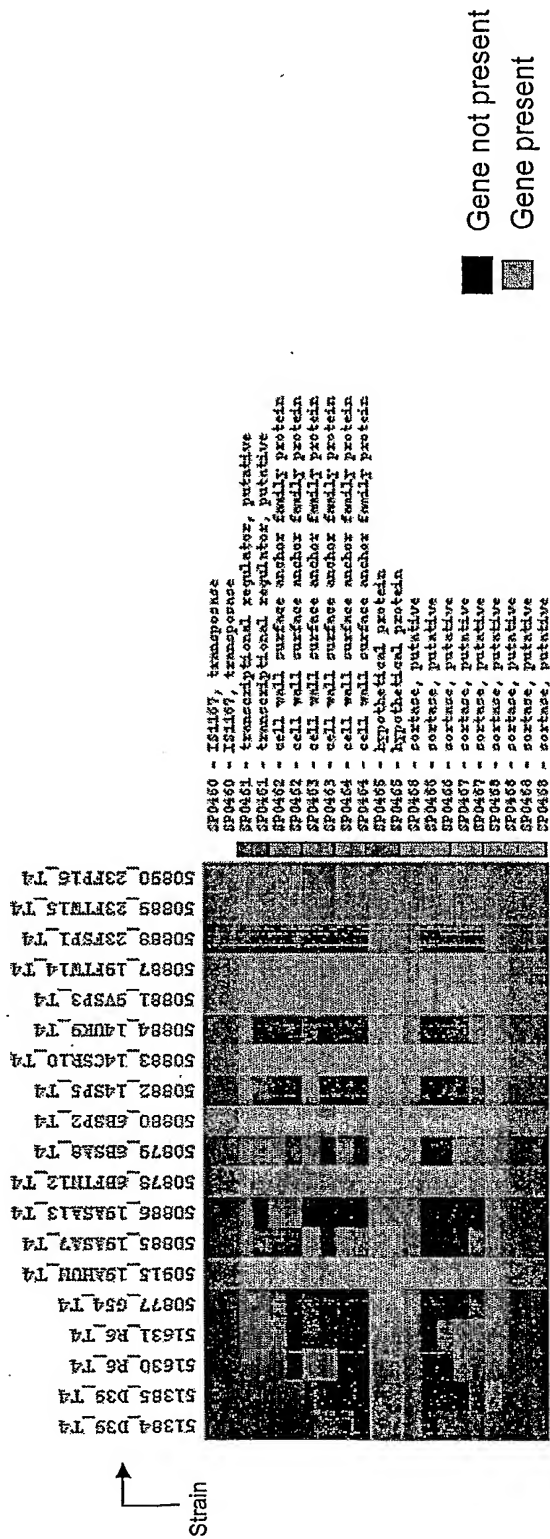


Figure 141A

ORF2_14CSR	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_19AH	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_19FTW	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_23FP	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_23FTW	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_670	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_6BF	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_6BSP	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_TIGR	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_9VSP	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN

ORF2_14CSR	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_19AH	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_19FTW	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_23FP	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_23FTW	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_670	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_6BF	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_6BSP	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_TIGR	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_9VSP	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR

ORF2_14CSR	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_19AH	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_19FTW	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_23FP	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_23FTW	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_670	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_6BF	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_6BSP	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_TIGR	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ
ORF2_9VSP	VRQKCGLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMWVTHMIVQ

ORF2_14CSR	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_19AH	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_19FTW	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_23FP	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_23FTW	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_670	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_6BF	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_6BSP	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_TIGR	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ
ORF2_9VSP	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMPILMEHCQ

ORF2_14CSR	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLSSKF
ORF2_19AH	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLSSKF
ORF2_19FTW	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLSSKF
ORF2_23FP	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLSSKF
ORF2_23FTW	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLSSKF
ORF2_670	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLSSKF
ORF2_6BF	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLSSKF
ORF2_6BSP	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLSSKF
ORF2_TIGR	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLSSKF
ORF2_9VSP	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLSSKF

Figure 141B

ORF2_14CSR KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE
ORF2_19AH KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE
ORF2_19FTW KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE
ORF2_23FP KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE
ORF2_23FTW KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE
ORF2_670 KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE
ORF2_6BF KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE
ORF2_6BSP KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE
ORF2_TIGR KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE
ORF2_9VSP KNILGNDISNSLSFLTALTFLTRTFLFGLQNLVPYNNYEHYGIIESDKPLYHISKAIVQE

ORF2_14CSR WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_19AH WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_19FTW WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_23FP WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_23FTW WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_670 WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_6BF WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_6BSP WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_TIGR WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPIFIILNNQADVNLIKSIILRNFTDK
ORF2_9VSP WMTEQKIEGVIDQHRLYLFSLYLTETIFSSSLPAIPIFIILNNQADVNLIKSIILRNFTDK

ORF2_14CSR VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_19AH VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_19FTW VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_23FP VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_23FTW VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_670 VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_6BF VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_6BSP VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_TIGR VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_9VSP VASVTGYNILISPPPSEHLTEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR

ORF2_14CSR LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_19AH LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_19FTW LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_23FP LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_23FTW LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_670 LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_6BF LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_6BSP LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_TIGR LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_9VSP LIYQTIVDIRKEAFDKRVAMIAKKAHYLL

Figure 142A

```
ORF3_19AH MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDVAF
ORF3_23FP MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDVAF
ORF3_14CSR MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDVAF
ORF3_670 MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDVAF
ORF3_6BF MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDVAF
ORF3_6BSP MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDVAF
ORF3_19FTW MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDVAF
ORF3_9VSP MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDVAF
ORF3_23FTW MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDVAF
ORF3_TIGR MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDVAF
*****

ORF3_19AH ELKNNTDGTTVSQRTEAQTGAEI FSNIKPGTYTLTEAQPPVGYPSTKQWTFVEVEKNGRT
ORF3_23FP ELKNNTDGTTVSQRTEAQTGAEI FSNIKPGTYTLTEAQPPVGYPSTKQWTFVEVEKNGRT
ORF3_14CSR ELKNNTDGTTVSQRTEAQTGAEI FSNIKPGTYTLTEAQPPVGYPSTKQWTFVEVEKNGRT
ORF3_670 ELKNNTDGTTVSQRTEAQTGAEI FSNIKPGTYTLTEAQPPVGYPSTKQWTFVEVEKNGRT
ORF3_6BF ELKNNTDGTTVSQRTEAQTGAEI FSNIKPGTYTLTEAQPPVGYPSTKQWTFVEVEKNGRT
ORF3_6BSP ELKNNTDGTTVSQRTEAQTGAEI FSNIKPGTYTLTEAQPPVGYPSTKQWTFVEVEKNGRT
ORF3_19FTW ELKNNTDGTTVSQRTEAQTGAEI FSNIKPGTYTLTEAQPPVGYPSTKQWTFVEVEKNGRT
ORF3_9VSP ELKNNTDGTTVSQRTEAQTGAEI FSNIKPGTYTLTEAQPPVGYPSTKQWTFVEVEKNGRT
ORF3_23FTW ELKNNTDGTTVSQRTEAQTGAEI FSNIKPGTYTLTEAQPPVGYPSTKQWTFVEVEKNGRT
ORF3_TIGR ELKNNTDGTTVSQRTEAQTGAEI FSNIKPGTYTLTEAQPPVGYPSTKQWTFVEVEKNGRT
*****

ORF3_19AH TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQH KALNPNPYERVIPEG
ORF3_23FP TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQH KALNPNPYERVIPEG
ORF3_14CSR TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQH KALNPNPYERVIPEG
ORF3_670 TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQH KALNPNPYERVIPEG
ORF3_6BF TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQH KALNPNPYERVIPEG
ORF3_6BSP TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQH KALNPNPYERVIPEG
ORF3_19FTW TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQH KALNPNPYERVIPEG
ORF3_9VSP TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQH KALNPNPYERVIPEG
ORF3_23FTW TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQH KALNPNPYERVIPEG
ORF3_TIGR TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQH KALNPNPYERVIPEG
*****

ORF3_19AH TLSKR IYQVN NLD D N Q Y G I E L T V S G K T T V E T K E A S T P L D V V I L L D N S N S M S N I R H N H A H R
ORF3_23FP TLSKR IYQVN NLD D N Q Y G I E L T V S G K T T V E T K E A S T P L D V V I L L D N S N S M S N I R H N H A H R
ORF3_14CSR TLSKR IYQVN NLD D N Q Y G I E L T V S G K T T V E T K E A S T P L D V V I L L D N S N S M S N I R H N H A H R
ORF3_670 TLSKR IYQVN NLD D N Q Y G I E L T V S G K T T V E T K E A S T P L D V V I L L D N S N S M S N I R H N H A H R
ORF3_6BF TLSKR IYQVN NLD D N Q Y G I E L T V S G K T T V E T K E A S T P L D V V I L L D N S N S M S N I R H N H A H R
ORF3_6BSP TLSKR IYQVN NLD D N Q Y G I E L T V S G K T T V E T K E A S T P L D V V I L L D N S N S M S N I R H N H A H R
ORF3_19FTW TLSKR IYQVN NLD D N Q Y G I E L T V S G K T T V E T K E A S T P L D V V I L L D N S N S M S N I R H N H A H R
ORF3_9VSP TLSKR IYQVN NLD D N Q Y G I E L T V S G K T T V E T K E A S T P L D V V I L L D N S N S M S N I R H N H A H R
ORF3_23FTW TLSKR IYQVN NLD D N Q Y G I E L T V S G K T T V E T K E A S T P L D V V I L L D N S N S M S N I R H N H A H R
ORF3_TIGR TLSKR IYQVN NLD D N Q Y G I E L T V S G K T T V E T K E A S T P L D V V I L L D N S N S M S N I R H N H A H R
*****

ORF3_19AH AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKG VADANGKI LND SALWTF
ORF3_23FP AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKG VADANGKI LND SALWTF
ORF3_14CSR AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKG VADANGKI LND SALWTF
ORF3_670 AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKG VADANGKI LND SALWTF
ORF3_6BF AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKG VADANGKI LND SALWTF
ORF3_6BSP AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKG VADANGKI LND SALWTF
ORF3_19FTW AERAGEATRSLIDKITSDPENRVALVTYASTIFDGTEFTVEKG VADKNGKRLNDSLFWNY
ORF3_9VSP AERAGEATRSLIDKITSDPENRVALVTYASTIFDGTEFTVEKG VADKNGKRLNDSLFWNY
ORF3_23FTW AERAGEATRSLIDKITSDPENRVALVTYASTIFDGTEFTVEKG VADKNGKRLNDSLFWNY
ORF3_TIGR AERAGEATRSLIDKITSDPENRVALVTYASTIFDGTEFTVEKG VADKNGKRLNDSLFWNY
*:*****:*:*****: : *****: ***** * *****: * *****: *
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 DRRTFTAKTYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD
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 DQTSFTTNTKDYSLKLTNDKNDIVELKNKVPTEAEDHDGNRLMYQFGATFTQKALMKAD
 * : * : * : * : * : * : * : * : * : * : * : * : * : * : * : * : * : * : *

DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE
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DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNFKAKTPNSSGILLE
DILTKQARPNSKKVIFHITDGVPTMSYPINFENHATFAPSYQNQLNAFFSKSPENKDGILLS
EILTQQARQNSQKVIHITDGVPTMSYPINFENHATFAPSYQNQLNVFFSKSPENKDGILLS
EILTQQARQNSQKVIHITDGVPTMSYPINFENHATFAPSYQNQLNAFFSKSPENKDGILLS
EILTQQARQNSQKVIHITDGVPTMSYPINFENHATFAPSYQNQLNAFFSKSPENKDGILLS
:***:*** *:*****::: :*:*:*:*:*****

[illegible]

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-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTTWYYNGNMAQDGYDVFTVGVGVNGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGAPTRWYYNGNIAPDGYDVFTVGVGIGINGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVGVGIGINGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVGVGIGINGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVGVGIGINGDP
:.* **:*.....* ***** ** *****:.* *****:.*.....*

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GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTTDPMGEL
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTTDPMGEL
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTTDPMGEL
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTTDPMGEL
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTTDPMGEL
GTDEATATSFMQSISSEKPNYTNVTDTTKILEQLNRYFHTIVTEKKSIENGTTDPMGEL
GTDEATATSFMQSISSEKPNYTNVTDTTKILEQLNRYFHTIVTEKKSIENGTTDPMGEL
GTDEATATSFMQSISSEKPNYTNVTDTTKILEQLNRYFHTIVTEKKSIENGTTDPMGEL
GTDEATATSFMQSISSEKPNYTNVTDTTKILEQLNRYFHTIVTEKKSIENGTTDPMGEL
***** : ***** - : ***** - *** *****

Figure 142C

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ORF3_19AH      IDFLQADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_23FP      IDFLQADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_14CSR     IDFLQADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_670       IDFLQADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_6BF       IDFLQADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_6BSP      IDFLQADGRFDPADYTLTANDGSSLVNNVPTGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_19FTW     IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_9VSP      IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_23FTW     IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNKAVFYDTEKIRIVTG
ORF3_TIGR      IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNKAVFYDTEKIRIVTG
                ****.****.*****.*****.*****.*****.*****.*****.*****

ORF3_19AH      LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_23FP      LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_14CSR     LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_670       LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_6BF       LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_6BSP      LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_19FTW     LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_9VSP      LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_23FTW     LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
ORF3_TIGR      LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRTTLHPKEVEKNTVRDFPIPKIRDVRKYP
                *****.*****.*****.*****.*****.*****.*****.*****

ORF3_19AH      EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_23FP      EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_14CSR     EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_670       EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_6BF       EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_6BSP      EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_19FTW     AITIAKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_9VSP      AITIAKEKKLGEIEFIKINKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_23FTW     EITISKEKKLGDIEFIKVNKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
ORF3_TIGR      EITISKEKKLGDIEFIKVNKNDKKPLRDAVFSLQKQHPDYDPIYGAIDQNGTYQNVRTGE
                *****.*****.*****.*****.*****.*****.*****.*****

ORF3_19AH      DGKLTfKNLSDGKfTENfEPfAKfKPVQNKPIVAFQIVNGEVRDVTsIVPDIPAGYEF
ORF3_23FP      DGKLTfKNLSDGKfTENfEPfAKfKPVQNKPIVAFQIVNGEVRDVTsIVPDIPAGYEF
ORF3_14CSR     DGKLTfKNLSDGKfTENfEPfAKfKPVQNKPIVAFQIVNGEVRDVTsIVPDIPAGYEF
ORF3_670       DGKLTfKNLSDGKfTENfEPfAKfKPVQNKPIVAFQIVNGEVRDVTsIVPDIPAGYEF
ORF3_6BF       DGKLTfKNLSDGKfTENfEPfAKfKPVQNKPIVAFQIVNGEVRDVTsIVPDIPAGYEF
ORF3_6BSP      DGKLTfKNLSDGKfTENfEPfAKfKPVQNKPIVAFQIVNGEVRDVTsIVPDIPAGYEF
ORF3_19FTW     DGKLTfKNLSDGKfTENfEPfAKfKPVQNKPIVAFQIVNGEVRDVTsIVPDIPAGYEF
ORF3_9VSP      DGKLTfKNLSDGKfTENfEPfAKfKPVQNKPIVAFQIVNGEVRDVTsIVPDIPAGYEF
ORF3_23FTW     DGKLTfKNLSDGKfTENfEPfAKfKPVQNKPIVAFQIVNGEVRDVTsIVPDIPAGYEF
ORF3_TIGR      DGKLTfKNLSDGKfTENfEPfAKfKPVQNKPIVAFQIVNGEVRDVTsIVPDIPAGYEF
                *****.*****.*****.*****.*****.*****.*****.*****

ORF3_19AH      TNDKHYITNEPIPPKREYPRfTGfGfGfGfMLfPFfYLfIGfCfMMfMGfVfLLfYfTRfKNfP
ORF3_23FP      TNDKHYITNEPIPPKREYPRfTGfGfGfGfMLfPFfYLfIGfCfMMfMGfVfLLfYfTRfKNfP
ORF3_14CSR     TNDKHYITNEPIPPKREYPRfTGfGfGfGfMLfPFfYLfIGfCfMMfMGfVfLLfYfTRfKHP
ORF3_670       TNDKHYITNEPIPPKREYPRfTGfGfGfGfMLfPFfYLfIGfCfMMfMGfVfLLfYfTRfKHP
ORF3_6BF       TNDKHYITNEPIPPKREYPRfTGfGfGfGfMLfPFfYLfIGfCfMMfMGfVfLLfYfTRfKHP
ORF3_6BSP      TNDKHYITNEPIPPKREYPRfTGfGfGfGfMLfPFfYLfIGfCfMMfMGfVfLLfYfTRfKHP
ORF3_19FTW     TNDKHYITNEPIPPKREYPRfTGfGfGfGfMLfPFfYLfIGfCfMMfMGfVfLLfYfTRfKHP
ORF3_9VSP      TNDKHYITNEPIPPKREYPRfTGfGfGfGfMLfPFfYLfIGfCfMMfMGfVfLLfYfTRfKHP
ORF3_23FTW     TNDKHYITNEPIPPKREYPRfTGfGfGfGfMLfPFfYLfIGfCfMMfMGfVfLLfYfTRfKHP
ORF3_TIGR      TNDKHYITNEPIPPKREYPRfTGfGfGfGfMLfPFfYLfIGfCfMMfMGfVfLLfYfTRfKHP
                *****.*****.*****.*****.*****.*****.*****.*****
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Figure 143A

ORF4_6BF	PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_6BSP	PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_670	PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_14CSR	PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_19AH	PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGXNGFNFLKLTEAGLAK
ORF4_23FP	PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKINGFNFLKLTEAGLAK
ORF4_23FTW	PKNSTLATAFWSDEMTEGLDYN-GDVVVNYNGQPLDNSHYTLEAGHNGFILKLNKEGLEA
ORF4_19FTW	PALANYATANWSDRMTEGLAFNKGTVKVTVDVALEAGDYALTEVATGFDLKLTDAGLAK
ORF4_9VSP	PALANYATANWSDRMTEGLAFNKGTVKVTVDVALEAGDYALTEVATGFDLKLTDAGLAK
ORF4_TIGR	PALANYATANWSDRMTEGLAFNKGTVKVTVDVALEAGDYALTEVATGFDLKLTDAGLAK
	* :. *: ***:*****: * : *

Figure 143B

```

ORF4_6BF      INKGDADQKIQTYSATLNSLAVADIPESNDITYHYGNHQDHGNTPKPTKPN-NQOITVT
ORF4_6BSP     INKGDADQKIQTYSATLNSLAVADIPESNDITYHYGNHQDHGNTPKPTKPN-NQOITVT
ORF4_670      INKGDADQKIQTYSATLNSLAVADIPESNDITYHYGNHQDHGNTPKPTKPN-NQOITVT
ORF4_14CSR    INKGDADQKIQTYSATLNSLAVADIPESNDITYHYGNHQDHGNTPKPTKPN-NQOITVT
ORF4_19AH     INKGDADQKIQTYSATLNSLAVADIPESNDITYHYGNHQDHGNTPKPTKPN-NQOITVT
ORF4_23FP     INKGDADQKIQTYSATLNSLAVADIPESNDITYHYGNHQDHGNTPKPTKPN-NQOITVT
ORF4_23FTW    INKDAEATITLKYTATLNALAVADVPEANDVTFHYGNPNPHGNTPKPNKPNK-NGELTIT
ORF4_19FTW    VNDQNAEKTVKITYSATLNDKAIVEVPESNDVTFNYGNPNPDHGNTPKPNKPNENGDLTLT
ORF4_9VSP     VNDQNAEKTVKITYSATLNDKAIVEVPESNDVTFNYGNPNPDHGNTPKPNKPNENGDLTLT
ORF4_TIGR     VNDQNAEKTVKITYSATLNDKAIVEVPESNDVTFNYGNPNPDHGNTPKPNKPNENGDLTLT
:*.::.:.:::***** *:::*****:*****:*****:*****:*****:

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ORF4_6BF      KTWDSQPAP---EGVKATVQLVNAKTGEKVGAP-----VELSENNWTTYTWSGLDNSIEY
ORF4_6BSP     KTWDSQPAP---EGVKATVQLVNAKTGEKVGAP-----VELSENNWTTYTWSGLDNSIEY
ORF4_670      KTWDSQPAP---EGVKATVQLVNAKTGEKVGAP-----VELSENNWTTYTWSGLDNSIEY
ORF4_14CSR    KTWDSQPAP---EGVKATVQLVNAKTGEKVGAP-----VELSENNWTTYTWSGLDNSIEY
ORF4_19AH     KTWDSQPAP---EGVKATVQLVNAKTGEKVGAP-----VELSENNWTTYTWSGLDNSIEY
ORF4_23FP     KTWDSQPAP---EGVKATVQLVNAKTGEKVGAP-----VELSENNWTTYTWSGLDNSIEY
ORF4_23FTW    KTWADAKDAPI-AGVEVTFDLVNAQTGEVVKVPGHETGIVLNQTNWTFATGLDNNTTEY
ORF4_19FTW    KTWVDATGAPIPAGAEATFDLVNAQTGKVVQTV-----TLTTDKNTVTVNGLDKNTEY
ORF4_9VSP     KTWVDATGAPIPAGAEATFDLVNAQTGKVVQTV-----TLTTDKNTVTVNGLDKNTEY
ORF4_TIGR     KTWVDATGAPIPAGAEATFDLVNAQTGKVVQTV-----TLTTDKNTVTVNGLDKNTEY
***          *:*:*:*:*:*:*:*:*:*:*:*:*:*:*:*:*:*:*:*:*:*:*

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ORF4_6BF K-VEEEYNGYSAEY-TVESKGLGVKNWKDNNPAPINPEEPRVKTYGKKFVKVDQKDTRL
ORF4_6BSP K-VEEEYNGYSAEY-TVESKGLGVKNWKDNNPAPINPEEPRVKTYGKKFVKVDQKDTRL
ORF4_670 K-VEEEYNGYSAEY-TVESKGLGVKNWKDNNPAPINPEEPRVKTYGKKFVKVDQKDTRL
ORF4_14CSR K-VEEEYNGYSAEY-TVESKGLGVKNWKDNNPAPINPEEPRVKTYGKKFVKVDQKDTRL
ORF4_19AH K-VEEEYNGYSAEY-TVESKGLGVKNWKDNNPAPINPEEPRVKTYGKKFVKVDQKDTRL
ORF4_23FP K-VEEEYNGYSAEY-TVESKGLGVKNWKDNNPAPINPEEPRVKTYGKKFVKVDQKDTRL
ORF4_23FTW KFVERTIKGSADYQITITETGKIAVKNWKDENPEPINPEEPRVKTYGKKFVKVDQKDERL
ORF4_19FTW KFVERSIKGSADYQEITTAGEIAVKNWKDENPKPLDPTEPKVVTYGKKFVKVNDKDNRL
ORF4_9VSP KFVERSIKGSADYQEITTAGEIAVKNWKDENPKPLDPTEPKVVTYGKKFVKVNDKDNRL
ORF4_TIGR KFVERSIKGSADYQEITTAGEIAVKNWKDENPKPLDPTEPKVVTYGKKFVKVNDKDNRL
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ORF4_6BF      ENAQFVVKKADSN-KYIAFKSTAQQAADEKAAATAKQKLDAAVAAY---TNAADKQAAQA
ORF4_6BSP     ENAQFVVKKADSN-KYIAFKSTAQQAADEKAAATAKQKLDAAVAAY----TNAADKQAAQA
ORF4_670      ENAQFVVKKADSN-KYIAFKSTAQQAADEKAAATAKQKLDAAVAAY---TNAADKQAAQA
ORF4_14CSR    ENAQFVVKKADSN-KYIAFKSTAQQAADEKAAATAKQKLDAAVAAY---TNAADKQAAQA
ORF4_19AH     ENAQFVVKKADSN-KYIAFKSTAQQAADEKAAATAKQKLDAAVAAY---TNAADKQAAQA
ORF4_23FP     ENAQFVVKKADSN-KYIAFKSTAQQAADEKAAATAKQKLDAAVAAY---TNAADKQAAQA
ORF4_23FTW    KEAQFVVKNEQG--KYLALKSAAQQAVNEKAAAEEKQALDAAIAAY---TNAADKNAAQA
ORF4_19FTW    AGAEFVIANADNAGQYLARKADKVSQEEKQLVVTTTKDALDRVAAYNALTAQQQTQQEKE
ORF4_9VSP     AGAEFVIANADNAGQYLARKADKVSQEEKQLVVTTTKDALDRVAAYNALTAQQQTQQEKE
ORF4_TIGR     AGAEFVIANADNAGQYLARKADKVSQEEKQLVVTTTKDALDRVAAYNALTAQQQTQQEKE
               *:::*:::~::~:~::~:~::~:~::~:~::~:~::~:~::~:~::~:~::~:~::~:~::~:
```

ORF4_6BF	LVDQAQQEYNVAYKEAKFGYEVAGKDE--AMVLTSNTDGGQFQISGLAAGT	KKLEIKAK
ORF4_6BSP	LVDQAQQEYNVAYKEAKFGYEVAGKDE--AMVLTSNTDGGQFQISGLAAGT	KKLEIKAK
ORF4_670	LVDQAQQEYNVAYKEAKFGYEVAGKDE--AMVLTSNTDGGQFQISGLAAGT	KKLEIKAK
ORF4_14CSR	LVDQAQQEYNVAYKEAKFGYEVAGKDE--AMVLTSNTDGGQFQISGLAAGT	KKLEIKAK
ORF4_19AH	LVDQAQQEYNVAYKEAKFGYEVAGKDE--AMVLTSNTDGGQFQISGLAAGT	KKLEIKAK
ORF4_23FP	LVDQAQQEYNVAYKEAKFGYEVAGKDE--AMVLTSNTDGGQFQISGLAAGT	KKLEIKAK
ORF4_23FTW	VVDAAQKTYNDNYRAARFGYEVERKED--ALVLTSNTDGGQFQISGLAAGS	KKLEIKAK
ORF4_19FTW	KVDKAQAAYNAAVIAANNAFEWVADKDNENVVKLVSDAQGRFEITGLLAGT	KKLEIKAK
ORF4_9VSP	KVDKAQAAYNAAVIAANNAFEWVADKDNENVVKLVSDAQGRFEITGLLAGT	KKLEIKAK
ORF4_TIGR	KVDKAQAAYNAAVIAANNAFEWVADKDNENVVKLVSDAQGRFEITGLLAGT	KKLEIKAK
	* * * * *	

PCT/US2005/027239

Figure 143C

ORF4_6BF	AKIDD-VEFVVGAGSWNQ--EFNYLKDVQKNDA TKVVKKITPOTGGIGTIIFAV
ORF4_6BSP	AKIDD-VEFVVGAGSWNQ--EFNYLKDVQKNDA TKVVKKITPOTGGIGTIIFAV
ORF4_670	AKIDD-VEFVVGAGSWNQ--EFNYLKDVQKNDA TKVVKKITPOTGGIGTIIFAV
ORF4_14CSR	AKIDD-VEFVVGAGSWNQ--EFNYLKDVQKNDA TKVVKKITPOTGGIGTIIFAV
ORF4_19AH	AKIDD-VEFVVGAGSWNQ--EFNYLKDVQKNDA TKVVKKITPOTGGIGTIIFAV
ORF4_23FP	AKIDD-VEFVVGAGSWNQ--EFNYLKDVQKNDA TKVVKKITPOTGGIGTIIFAV
ORF4_23FTW	AKLGD-VKFEVGAGSWNQ--DFNYLKDVQKNDA TKVVKKITPOTGGIGTIIFAV
ORF4_19FTW	ALLTSRQKFEVTATSYSATGQGIETAGSGKDDATKVVKKITPOTGGIGTIIFAV
ORF4_9VSP	ALLTSRQKFEVTATSYSATGQGIETAGSGKDDATKVVKKITPOTGGIGTIIFAV
ORF4_TIGR	ALLTSRQKFEVTATSYSATGQGIETAGSGKDDATKVVKKITPOTGGIGTIIFAV

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ORF4_6BF	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_6BSP	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_670	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_14CSR	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_19AH	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_23FP	AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_23FTW	AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_19FTW	AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_9VSP	AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_TIGR	AGAAIMGIAVYAYVKNNKDEDQLA

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PCT/US05/27239

Figure 144A

ORF5_6BSP -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVQLQENYQEV
ORF5_TIGR -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVQLQENYQEV
ORF5_6BF -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVQLQENYQEV
ORF5_670 -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVQLQENYQEV
ORF5_19AH -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVQLQENYQEV
ORF5_14CSR -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVQLQENYQEV
ORF5_19FTW -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVQLQENYQEV
ORF5_23FTW -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVQLQENYQEV
ORF5_9VSP MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVQLQENYQEV
ORF5_23FP -----MTMQMKQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVQLQENYQEV

ORF5_6BSP VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV
ORF5_TIGR VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV
ORF5_6BF VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV
ORF5_670 VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV
ORF5_19AH VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV
ORF5_14CSR VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV
ORF5_19FTW VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV
ORF5_23FTW VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV
ORF5_9VSP VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV
ORF5_23FP VSQLP SRDGHRLQVWKLDDSYSDRRVQIVRDLHSDENKLSSEFKKTSFEMTFLENQIEV

ORF5_6BSP SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_TIGR SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_6BF SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_670 SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_19AH SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_14CSR SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_19FTW SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_23FTW SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_9VSP SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_23FP SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH

ORF5_6BSP NRLEGVGFKLVS VARDGSEKEVPLIGEYRYS SSGQVGR TLYTDKNGE I FVTNPLGN YRF
ORF5_TIGR NRLEGVGFKLVS VARDVSEKEVPLIGEYRYS SSGQVGR TLYTDKNGE I FVTNPLGN YRF
ORF5_6BF NRLEGVGFKLVS VARDGSEKEVPLIGEYRYS SSGQVGR TLYTDKNGE I FVTNPLGN YRF
ORF5_670 NRLEGVGFKLVS VARDGSEKEVPLIGEYRYS SSGQVGR TLYTDKNGE I FVTNPLGN YRF
ORF5_19AH NRLEGVGFKLVS VARDGSEKEVPLIGEYRYS SSGQVGR TLYTDKNGE I FVTNPLGN YRF
ORF5_14CSR NRLEGVGFKLVS VARDGSEKEVPLIGEYRYS SSGQVGR TLYTDKNGE I FVTNPLGN YRF
ORF5_19FTW NRLEGVGFKLVS VARDGSEKEVPLIGEYRYS SSGQVGR TLYTDKNGE I FVTNPLGN YRF
ORF5_23FTW NRLEGVGFKLVS VARDGSEKEVPLIGEYRYS SSGQVGR TLYTDKNGE I FVTNPLGN YRF
ORF5_9VSP NRLEGVGFKLVS VARDGSEKEVPLIGEYRYS SSGQVGR TLYTDKNGE I FVTNPLGN YRF
ORF5_23FP NRLEGVGFKLVS VARDGSEKEVPLIGEYRYS SSGQVGR TLYTDKNGE I FVTNPLGN YRF

ORF5_6BSP KEVEPLAGYAVTTLD TDVQLVDHQLVTITV V NQKLPRGNVDFMKVDGR T NTSLQGA MFKV
ORF5_TIGR KEVEPLAGYAVTTLD TDVQLVDHQLVTITV V NQKLPRGNVDFMKVDGR T NTSLQGA MFKV
ORF5_6BF KEVEPLAGYAVTTLD TDVQLVDHQLVTITV V NQKLPRGNVDFMKVDGR T NTSLQGA MFKV
ORF5_670 KEVEPLAGYAVTTLD TDVQLVDHQLVTITV V NQKLPRGNVDFMKVDGR T NTSLQGA MFKV
ORF5_19AH KEVEPLAGYAVTTLD TDVQLVDHQLVTITV V NQKLPRGNVDFMKVDGR T NTSLQGA MFKV
ORF5_14CSR KEVEPLAGYAVTTLD TDVQLVDHQLVTITV V NQKLPRGNVDFMKVDGR T NTSLQGA MFKV
ORF5_19FTW KEVEPLAGYAVTTLD TDVQLVDHQLVTITV V NQKLPRGNVDFMKVDGR T NTSLQGA MFKV
ORF5_23FTW KEVEPLAGYAVTTLD TDVQLVDHQLVTITV V NQKLPRGNVDFMKVDGR T NTSLQGA MFKV
ORF5_9VSP KEVEPLAGYAVTTLD TDVQLVDHQLVTITV V NQKLPRGNVDFMKVDGR T NTSLQGA MFKV
ORF5_23FP KEVEPLAGYAVTTLD TDVQLVDHQLVTITV V NQKLPRGNVDFMKVDGR T NTSLQGA MFKV

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Figure 144B

```
ORF5_6BSP      MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEEYGT  LWELOAPTCGVQLTSPVSFTI
ORF5_TIGR      MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEEYGT  LWELOAPTCGVQLTSPVSFTI
ORF5_6BF       MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEEYGT  LWELOAPTCGVQLTSPVSFTI
ORF5_670       MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEEYGT  LWELOAPTCGVQLTSPVSFTI
ORF5_19AH      MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEEYGT  LWELOAPTCGVQLTSPVSFTI
ORF5_14CSR     MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEEYGT  LWELOAPTCGVQLTSPVSFTI
ORF5_19FTW     MKEENGHYTPVLQNGKEVVASGKDGRFRVEGLEEYGT  LWELOAPTCGVQLTSPVSFTI
ORF5_23FTW     MKEENGHYTPVLQNGKEVVASGKDGRFRVEGLEEYGT  LWELOAPTCGVQLTSPVSFTI
ORF5_9VSP      MKEENGHYTPVLQNGKEVVASGKDGRFRVEGLEEYGT  LWELOAPTCGVQLTSPVSFTI
ORF5_23FP      MKEENGHYTPVLQNGKEVVASGKDGRFRVEGLEEYGT  LWELOAPTCGVQLTSPVSFTI
****.*****.*****
```

```
ORF5_6BSP      GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKPNN
ORF5_TIGR      GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKPNN
ORF5_6BF       GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKPNN
ORF5_670       GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKPNN
ORF5_19AH      GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKPNN
ORF5_14CSR     GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKPNN
ORF5_19FTW     GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKTN
ORF5_23FTW     GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKTN
ORF5_9VSP      GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKTN
ORF5_23FP      GKDTRKELVTVVKNNKRPRIDVPDTGEETLYILMLVAILLFGSGYYLTKKTN
*****.*****
```


Figure 145A

[illegible]

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Figure 145B

ORF6_23FTW	DGQQ
ORF6_TIGR	DGQQ
ORF6_6BSP	DGQQ
ORF6_6BF	DGQQ
ORF6_670	DGQQ
ORF6_19AH	DGQQ
ORF6_14CSR	DGQQ
ORF6_23FP	DE--
ORF6_9VSP	DE--
ORF6_19FTW	DE-

```

ORF7_14CSR      MDNSRRSRKKGTGTTTTKPLILLIIFLVGFVAIAIYPLVSRYYYRIESNEVIKEFDETQVSM
ORF7_19AH      MDNSRRSRKKGTGTTTTKPLILLIIFLVGFVAIAIYPLVSRYYYRIESNEVIKEFDETQVSM
ORF7_6BF       MDNSRRSRKKGTGTTTTKPLILLIIFLVGFVAIAIYPLVSRYYYRIESNEVIKEFDETQVSM
ORF7_6BSP      MDNSRRSRKKGTGTTTTKPLILLIIFLVGFVAIAIYPLVSRYYYRIESNEVIKEFDETQVSM
ORF7_670       MDNSRRSRKKGTGTTTTKPLILLIIFLVGFVAIAIYPLVSRYYYRIESNEVIKEFDETQVSM
ORF7_23FTW     MDNSRRSRKKGTGTTTTKPLILLIIFLVGFVAIAIYPLVSRYYYRIESNEVIKEFDETQVSM
ORF7_23FP      MSKSRYSRKKSVKKKKKNPFTILLIIFLVGLAVAMYPLVSRYYYRIESNEVIKEFDETQVSM
ORF7_9VSP      MSKSRYSRKKSVKKKKKNPFTILLIIFLVGLAVAMYPLVSRYYYRIESNEVIKEFDETQVSM
ORF7_19FTW     MSKSRYSRKKSVKKKKKNPFTILLIIFLVGLAVAMYPLVSRYYYRIESNEVIKEFDETQVSM
ORF7_TIGR      MDNSRRSRKKGTGTTTTKPLILLIIFLVGFVAIAIYPLVSRYYYRIESNEVIKEFDETQVSM
                * . : * * * * * . : * * * * * : * : * * * * * : * * : * * * * * * * * * * * * * * * * * *

ORF7_14CSR      DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIQ
ORF7_19AH      DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIQ
ORF7_6BF       DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIQ
ORF7_6BSP      DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIQ
ORF7_670       DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIQ
ORF7_23FTW     DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIQ
ORF7_23FP      DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIQ
ORF7_9VSP      DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIQ
ORF7_19FTW     DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIQ
ORF7_TIGR      DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIQ
                * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : *

ORF7_14CSR      EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTFAHRGLPTAEELFSQDKMKKGDVF
ORF7_19AH      EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTFAHRGLPTAEELFSQDKMKKGDVF
ORF7_6BF       EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTFAHRGLPTAEELFSQDKMKKGDVF
ORF7_6BSP      EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTFAHRGLPTAEELFSQDKMKKGDVF
ORF7_670       EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTFAHRGLPTAEELFSQDKMKKGDVF
ORF7_23FTW     EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTFAHRGLPTAEELFSQDKMKKGDVF
ORF7_23FP      EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTFAHRGLPTAEELFSQDKMKKGDIF
ORF7_9VSP      EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTFAHRGLPTAEELFSQDKMKKGDIF
ORF7_19FTW     EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTFAHRGLPTAEELFSQDKMKKGDIF
ORF7_TIGR      EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVTFAHRGLPTAEELFSQDKMKKGDIF
                * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : *

ORF7_14CSR      YLHVLDQVLAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_19AH      YLHVLDQVLAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_6BF       YLHVLDQVLAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_6BSP      YLHVLDQVLAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_670       YLHVLDQVLAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_23FTW     YLHVLDQVLAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_23FP      YLHVLDQVLAYQVDQIVTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_9VSP      YLHVLDQVLAYQVDQIVTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_19FTW     YLHVLDQVLAYQVDQIVTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_TIGR      YLHVLDQVLAYQVDQIVTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
                * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : *

ORF7_14CSR      TAPIAERNRAVRERGQFWLWLLLAALVMILVLSYGVYRHRIRVKGLEKQLEEHVKG
ORF7_19AH      TAPIAERNRAVRERGQFWLWLLLAALVMILVLSYGVYRHRIRVKGLEKQLEEHVKG
ORF7_6BF       TAPIAERNRAVRERGQFWLWLLLAALVMILVLSYGVYRHRIRVKGLEKQLEEHVKG
ORF7_6BSP      TAPIAERNRAVRERGQFWLWLLLAALVMILVLSYGVYRHRIRVKGLEKQLEEHVKG
ORF7_670       TAPIAERNRAVRERGQFWLWLLLAALVMILVLSYGVYRHRIRVKGLEKQLEEHVKG
ORF7_23FTW     TAPIAERNRAVRERGQFWLWLLLAALVMILVLSYGVYRHRIRVKGLEKQLEEHVKG
ORF7_23FP      TAPIAERNRAVRERGQFWLWLLLGAMAVILLLLYRVYRNRIRVKGLEKQLEGRHVVD
ORF7_9VSP      TAPIAERNRAVRERGQFWLWLLLGAMAVILLLLYRVYRNRIRVKGLEKQLEGRHVVD
ORF7_19FTW     TAPIAERNRAVRERGQFWLWLLLGAMAVILLLLYRVYRNRIRVKGLEKQLEGRHVVD
ORF7_TIGR      TAPIAERNRAVRERGQFWLWLLLGAMAVILLLLYRVYRNRIRVKGLEKQLEGRHVVD
                * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : *

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ORF8_14CSR      FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_19AH      FTKEGQSVSRVATSQWLYRGLVVLAFMGILFVLWKLARLLRGK
ORF8_23FTW     FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_670       FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_6BF       FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_6BSP      FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_19FTW     FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_23PF      FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_9VSP      FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_TIGR      FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
*****

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RrgA, LPXTG

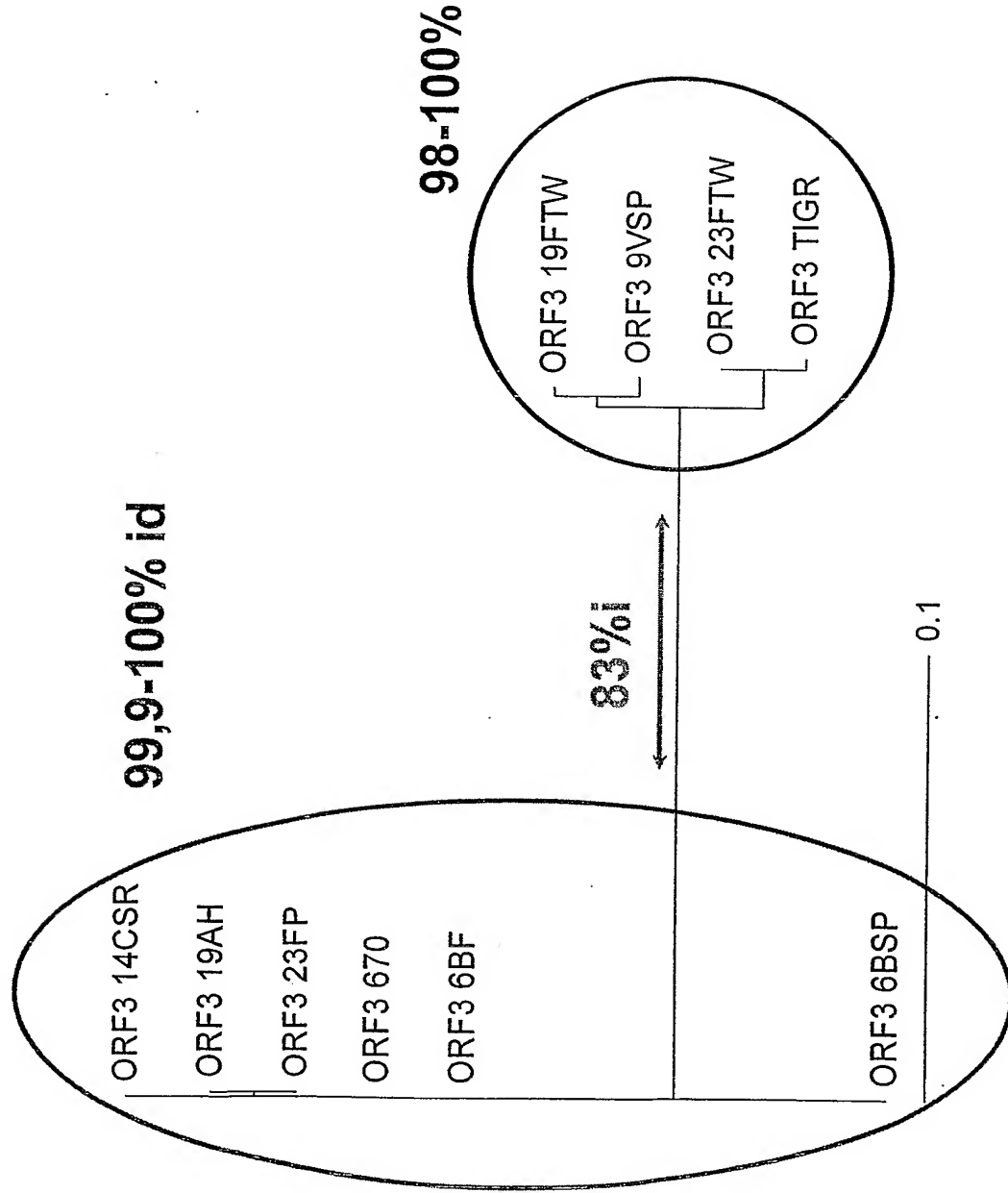


Figure 148

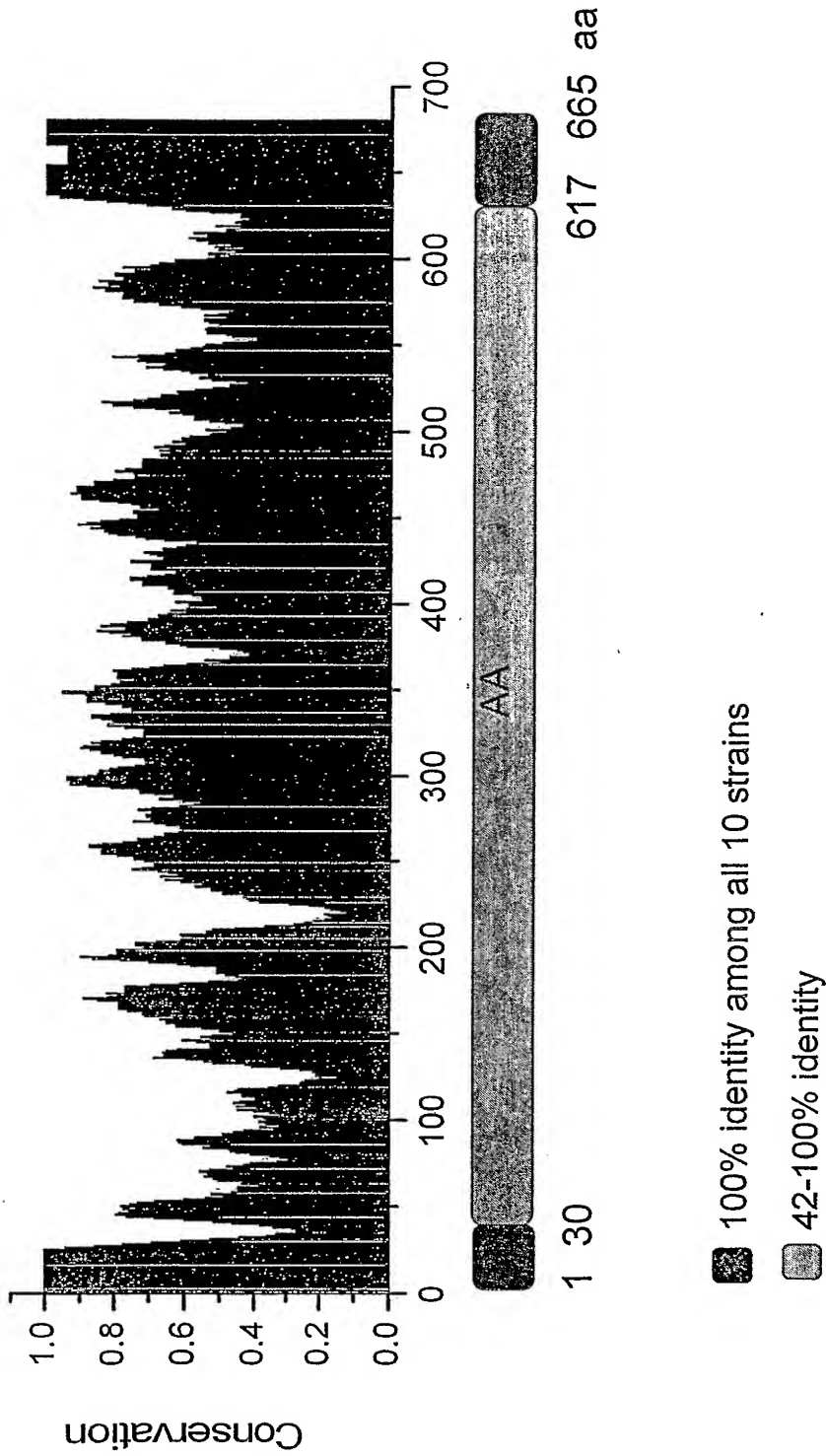


Figure 149

A

MLNRETHMKVKRKFQKAVAGLCCISQLTAFSSIVALA*ETPETS PAIGKVVIKETGEGGALLGDAVFELKN
 NTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQQPVGYKPKSTKQWTVVEKNGRRTTVQGEQVENREE
 ALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPGTL SKRIYQVNNLDDNQYGIEL
 TVSGKTVYEQDKSVPLDVVILLDNSMSNIRNKNARRAERAGEATRSIDKITSSEN RVALV TYAS
 TIFDGTFTVEKGVADKNGKRLNDSLFWNYDQTSFTTNTKDYSLKLTNDKNDIVELKNKVPTAEEDHD
 GNRLMYQFGATFTQKALMKADEILTQQARQNSQKVIFHITDGVPTMSYPINFNHA TFAPSYQNQLNA
 FFSKSPNKDGILLSDFITQATSGEHTIVRGDQSYQMFTDKTVYEKGAPAAFPVKPEKYSEMKAAGYAVI
 GDPINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVGIGINGDPGTDEATA
 TSFMQSISSKPENYTNVTDTTKILEQLNR YFHTIVTEKKSIE NGTITDPMGELIDLQLGTDGRFDPADYTL
 TANDGSRLENGQAVGGPQNDGGLLKNAKVL YDTTEKRIRVTGL YLGTDEKVTLTYNVRLNDEFVSNKFYD
 TNGRTTLHPKEVEQNTVRDFPKIRDVRKYPEITISKEKKGDI EFIKVKNKNDKKPLRGAVFSLQKQHPDYP
 DIYGAIQNGTYQNVRTGEDGKLT FKNLSDGKYRLFENSEPAGYKPVQNKPIVAFQIVNGEVRDVT SIVPQ
 DIPAGYEFTNDKHYYITNEP PPKREYPR TGGIGMLPFY LIGCMMMG VL YTRKHP

B

5' cgggatcc-gaa-acg-cct-gaa-acc-agt 5' 24mer, 54 %G+C, Tm 62

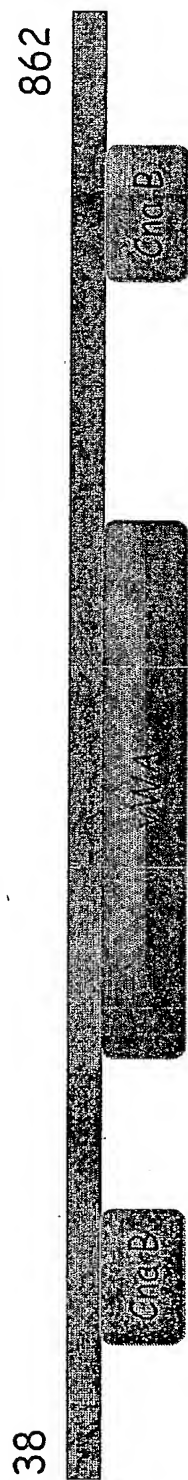
*Bam*HI

3' ccgctcgag-aat-agg-ttc-att-ggt 3' 27mer, 52 %G+C, Tm 61.6

*Xho*I

Figure 150

A.

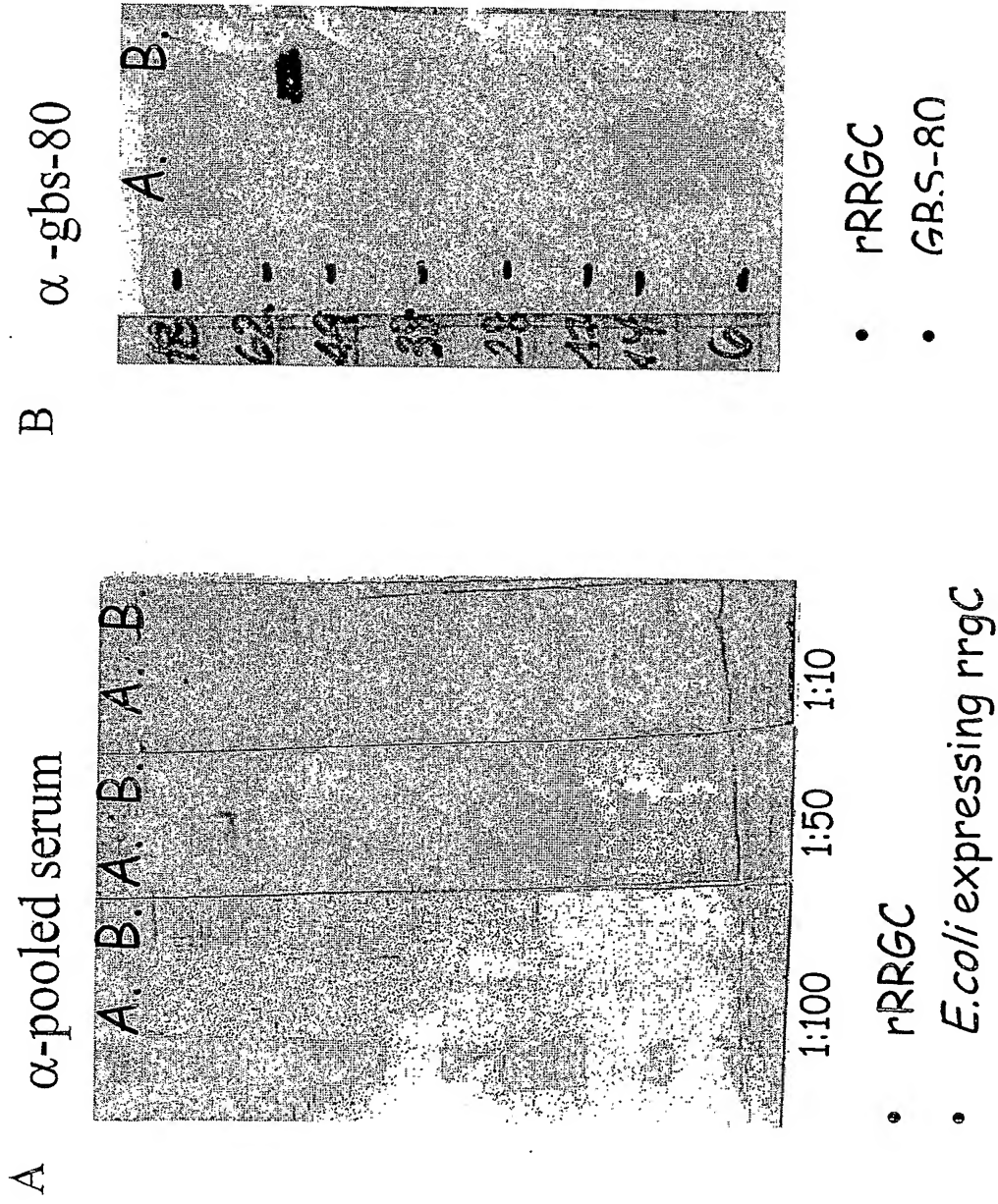


B.



Figure 151

Figure 152



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A

MKSINKFLTMLAALLLTASSLS* AATVFAAGTTTTSVTVHKLLATDGDMDKIANELETGNYAGNKVGVLP
 NAKELAGVMFVWNTNNEIIDENGQTLGVNIDPQTFKLSGAMPATAMKKLTEAEGAKFNTANLPAAKYKIY
 EHSLSYVGEDGATLTGSKAVPIEIELPLNDVVDVHVYPKNTAKPKIDKDFKGKANPDTPRVDKDTPVNHQV
 GDVVEYEVTKIPALANYATANWSDRMTEGLAFNKGTVKVTVDDVVALEAGDYALTEVATGFDLKLTDAGLAK
 VNDQNAEKTIVKITYSATLNDKAIIVEVPESNDVTFNYGNNPDHGNTPKNKPNENGDLTLTKTWVDATGAPIP
 AGAEATFDLVNAQTGKVVQTVTLTTDKNTVTVNGLDKNTYKFVVERSIKGYSDYQEITTA GEIAVKNNWKD
 ENPKPLDPTEPKVVITYGKKFVKVNDKDNRLA GAEFVIANADNAGQYLARKADKVSQEEKQLVVTTKDALDRAV
 AAYNALTAQQQTQQEKEKVDKAQAAYNAAVLAANNAFEWVADKDNNVVKLVSDAQGRFEITGLLAGTY
 YLEETKQPAGYALLTSRQKFEVTATSYSATGQGIEYTAGSGKDDATKVVNKKITIPQTGGIGTIFAVAGAAI
 MGLAVYAYVKNKDEDEQLA

B

5' cgggatcc-gct-gca-aca-gtt-ttt 3' 23mer, 52.2% G+C, Tm 60.6
*Bam*HI
 5' ccgctcgag-agt-gat-ttt-ttt-gtt-gac 3' 26mer, 44.4% G+C, Tm 61.7
*Xho*I

Figure 153

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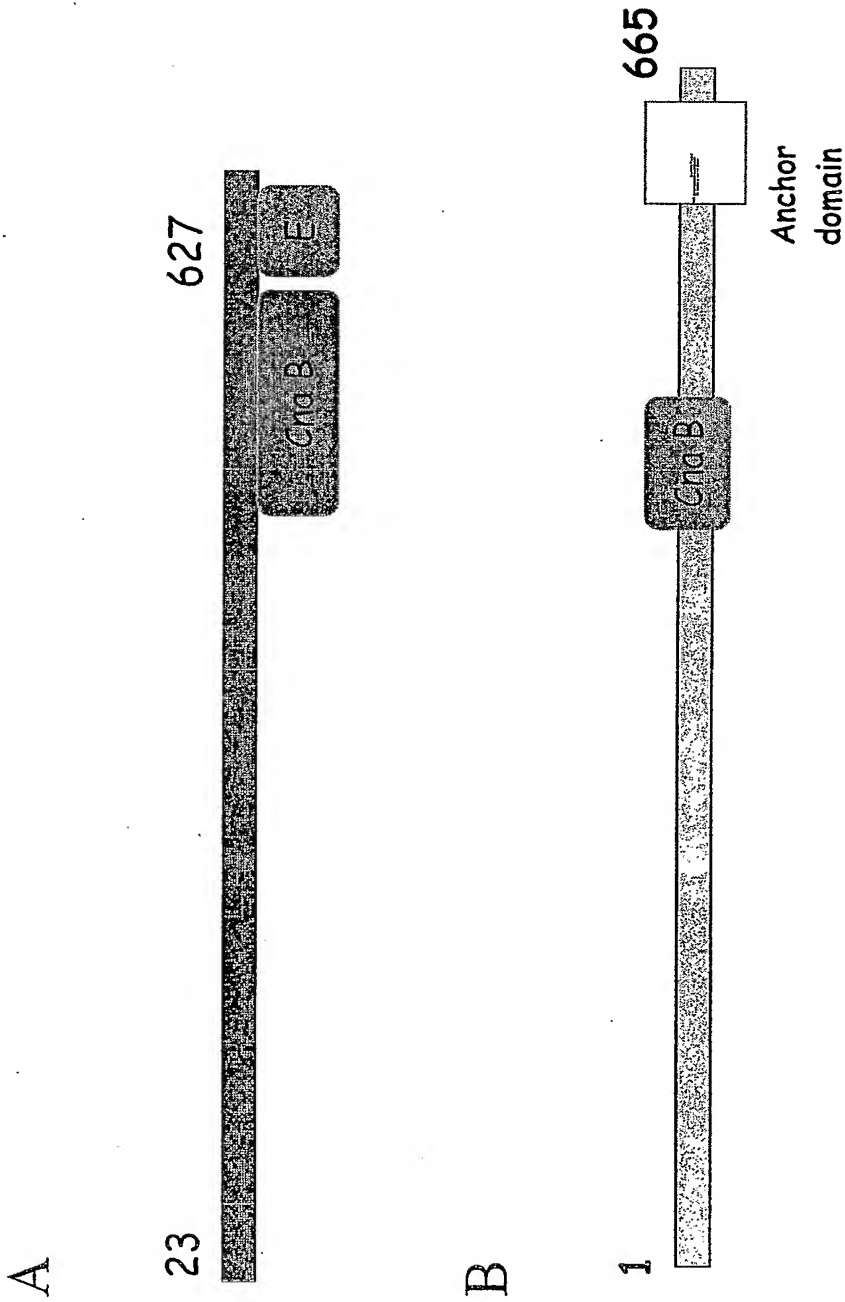
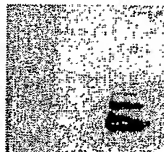


Figure 154

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60 kDa
←

Figure 155

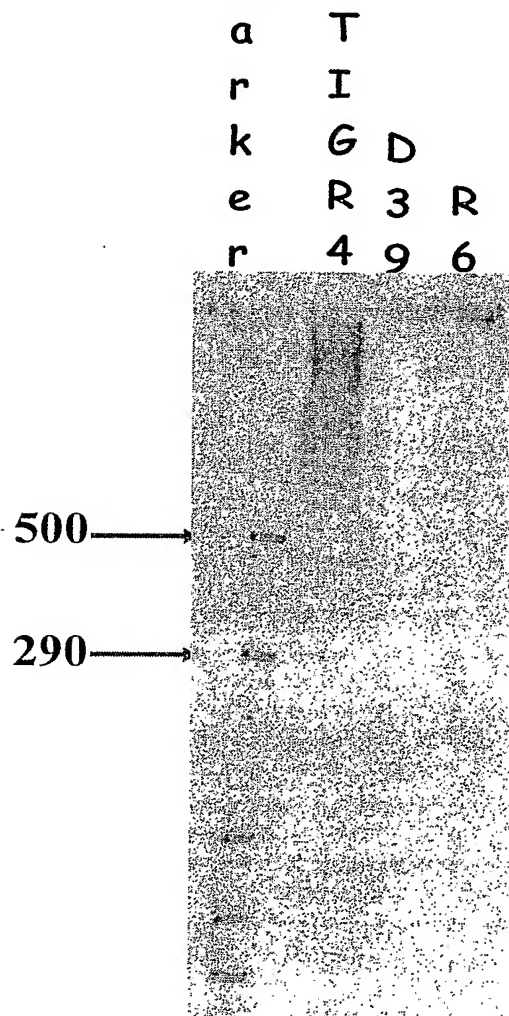


Figure 156

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A

MISRIFFVMA~~LCFSLVWGA~~*H~~AVOAQEDHTL~~VLQENYQEVVSQLPSRDGHR~~LQVWKLDDSYS~~
 YDDR~~VQIVRDLHSWDENKLS~~FFKKT~~SFEMTFLENQIEVSHIPNGL~~YYVRSIQ~~TD~~AVSYP~~AEFLF~~
 EMTDQ~~TVEPLVIVAKKTD~~MTTKVKLIKVDQDHN~~RLEGVGFKLVSVARDVSEKEVPLIGEYRYSS~~
 GQVGR~~TL~~YTDKNGE~~IFVTNLPLGN~~YR~~FEKEVEPLAGYAVTTLD~~TDVQLVDH~~QLVTTTVVNQKLPRGN~~
 VDFMKV~~DGRINTSLQGAMFKVMKEESGHYTPVLQNGKEVV~~TS~~GKDGRFRVEGLE~~YGTYYLWELQ
 APTGYVQLTSPVSFTIGK~~DTRKELVTIVVKNNKRP~~RDV~~PD~~TEETLYILMLVAIL~~FGSGYYLTKKP~~
 NN

B

5' cg~~ggatcc~~-cat-gtc-caa-gcg-caa-gaa 21mer, 61% G+C, Tm 60.8

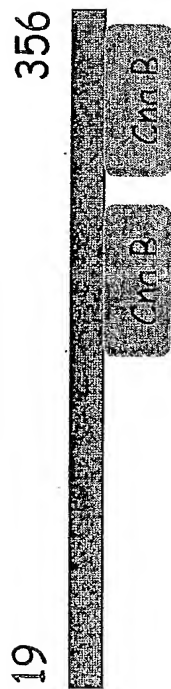
*Bam*HI

5' ccg~~ctcgag~~-ctt-gtt-att-ttt-aac-cac 27mer, 44% G+C, Tm 58.4

*Xho*I

Figure 157

A



B



Figure 158

PCT/US05/27239 357/487

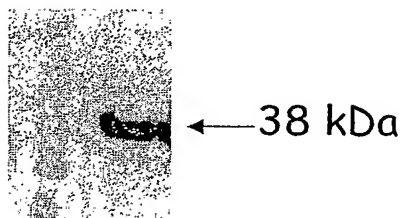


Figure 159

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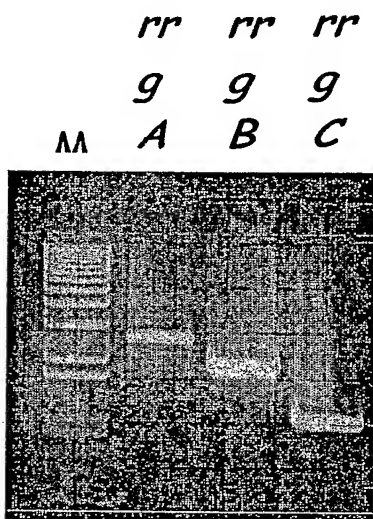
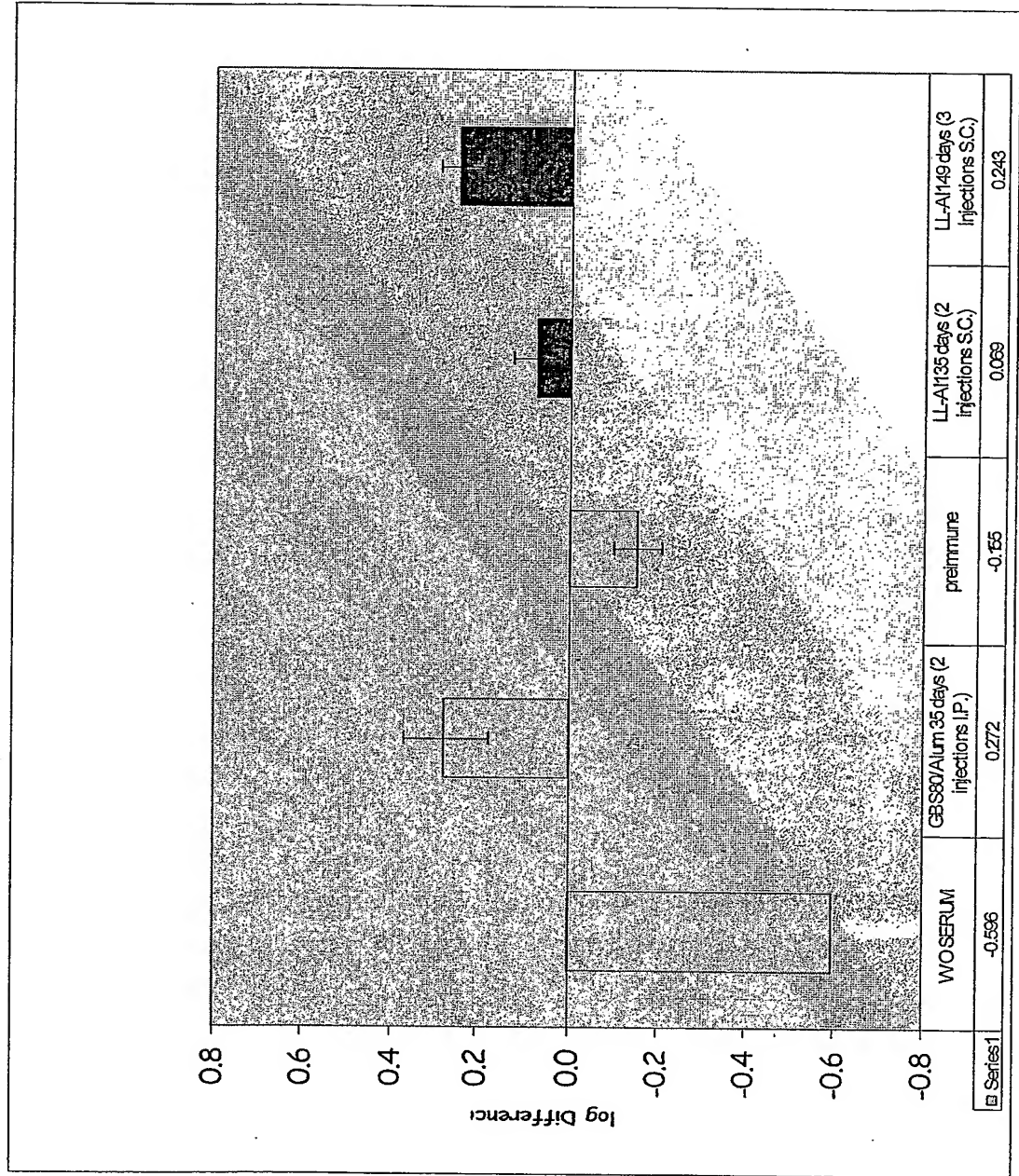


Figure 160

Figure 161



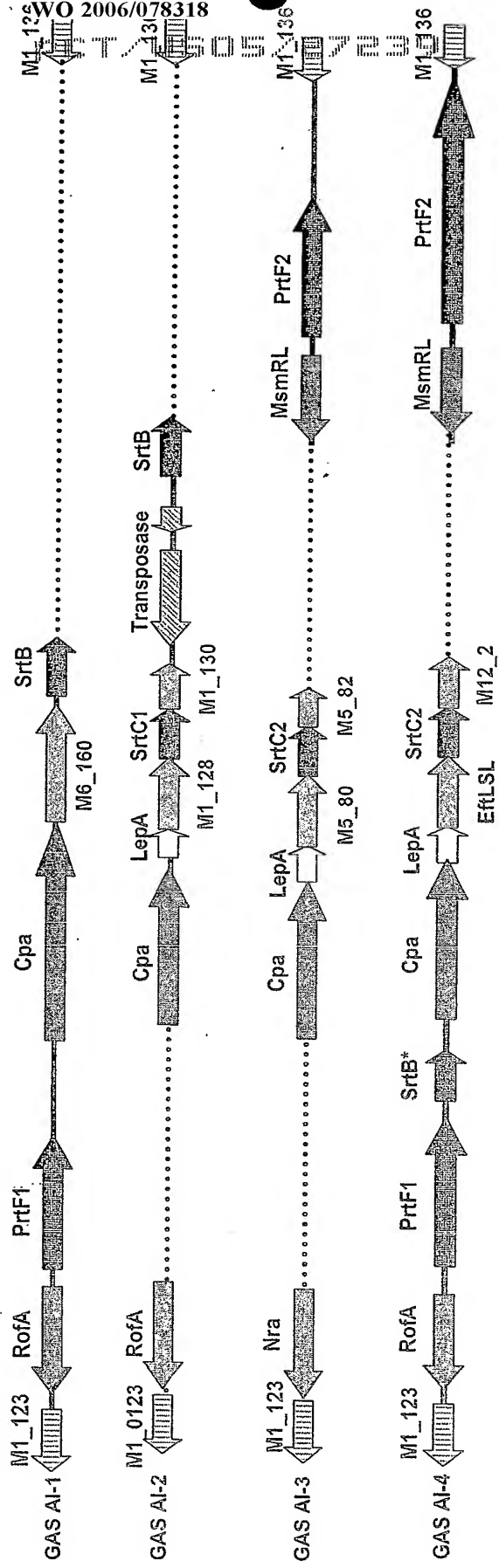
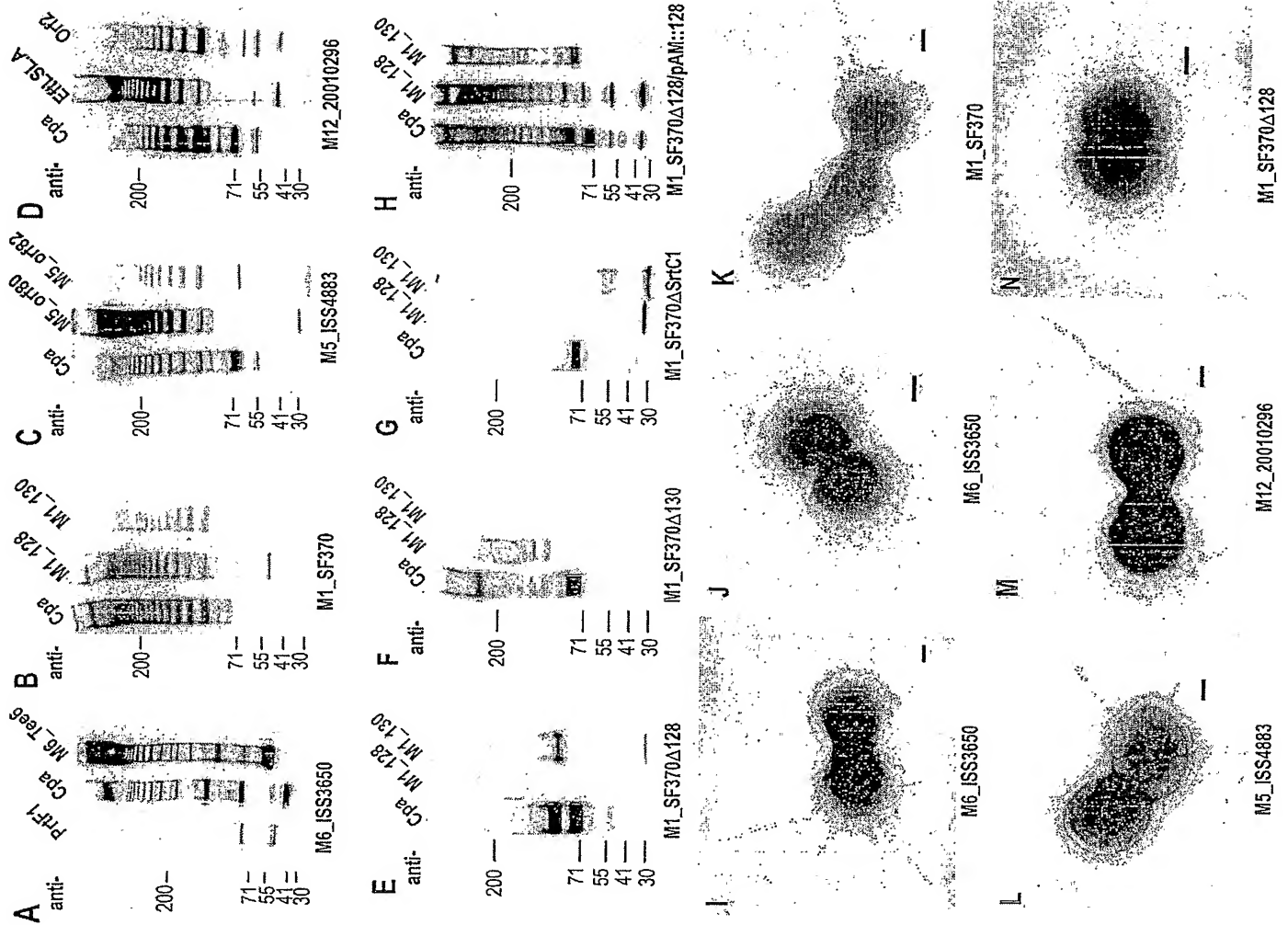


FIGURE 162

Figure 163



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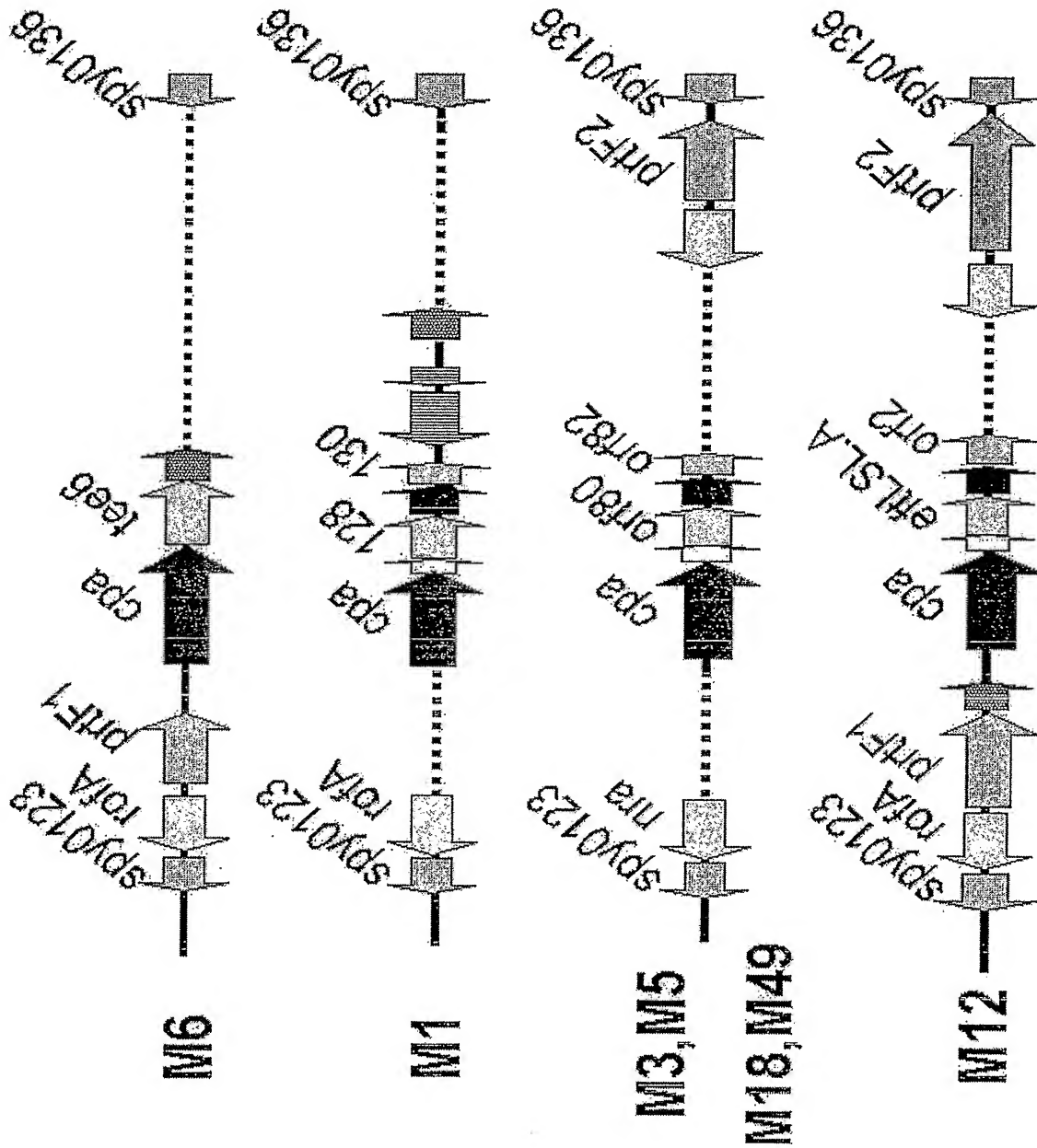


Figure 164

PCT/US05/27239363/487

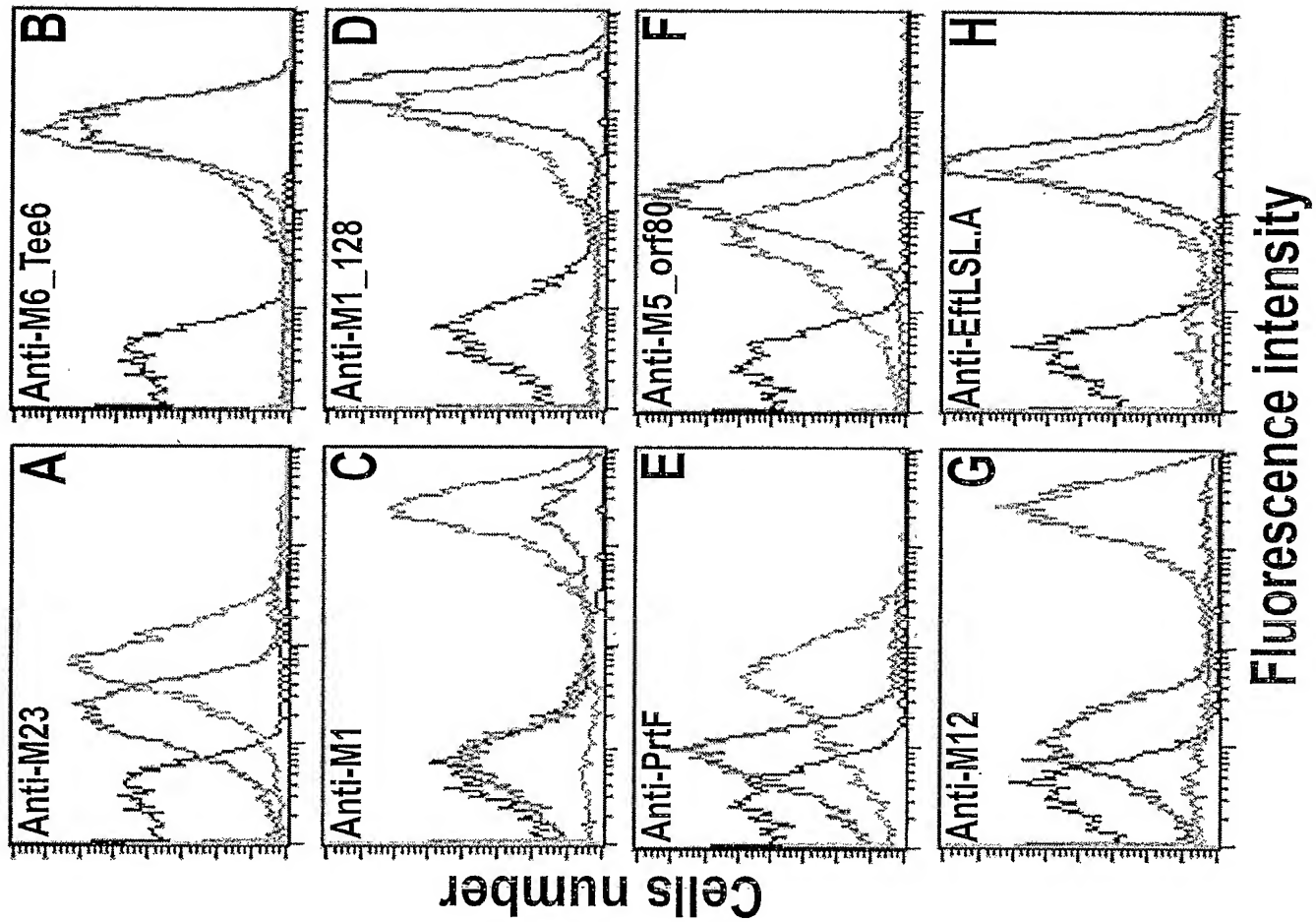


Figure 165

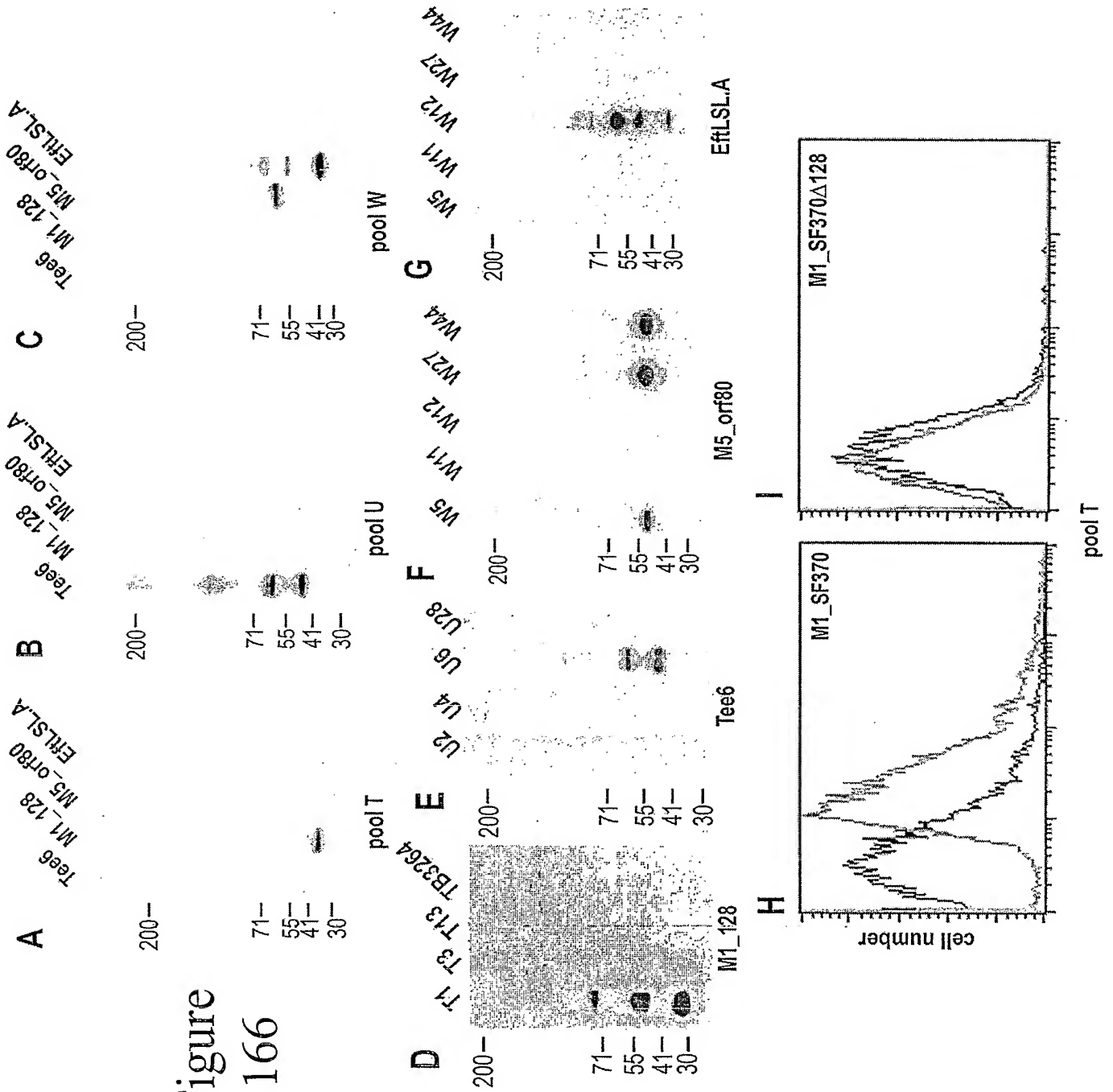


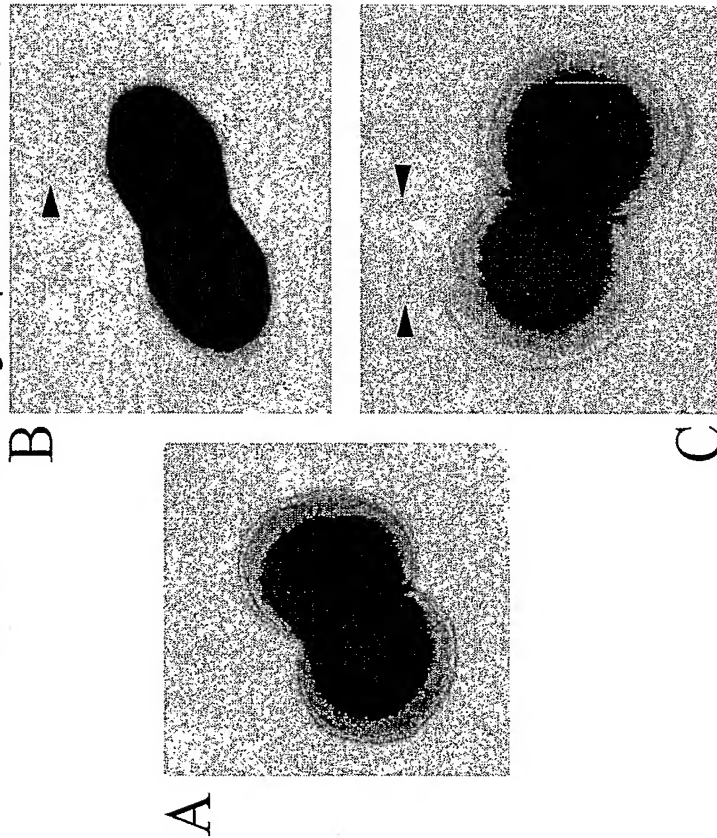
Figure 167

Strain	M-type	PCR					AI	Sequence
		SrtB	SrtC1	SrtC2	MsmRL	SipA2		
2724	6	+	-	-	-	-	1	
2894	6	+	-	-	-	-	1	
3650	6	+	-	-	-	-	1	
5529	6	+	-	-	-	-	1	
Dsm2071	23	+	-	-	-	-	1	+
SF370	1	+	+	-	-	-	2	literature
2580	1	+	+	-	-	-	2	
2913	1	+	+	-	-	-	2	
3280	1	+	+	-	-	-	2	
3348	1	+	+	-	-	-	2	
2719	?	+	+	-	-	-	2	
2721	3	-	-	+	+	+	3	
3040	3	-	-	+	+	+	3	
3135	3	-	-	+	+	+	3	
3776	44 ?	-	-	+	+	+	3	+
4959	77	-	-	+	+	+	3	+
4088	Clinical isolate	-	-	+	+	+	3	
2728	12	+	-	+	+	+	4	
2720	9	+	-	+	+	+	4	+
2727	11	+	-	+	+	+	4	+
4436	28	+	-	+	+	+	4	+
5481	44 ?	+	-	+	+	+	4	+
4538	50	+	-	+	+	+	4	+
3789	78	+	-	+	+	+	4	+
4883	5	+	-	+	+	+	4	
5476	89	+	-	+	+	+	4	
5495	?	+	-	+	+	+	4	
2722	4	-	-	-	-	-	?	
2723	5?	-	-	-	-	-	?	
2725	8	-	-	+	-	-	?	
2726	2	-	-	-	-	-	?	
2634	4	-	-	-	-	-	?	
5531	75	+	+	-	-	-	?	In progress

Figure 168

Immuno-electronmicroscopy

(Immunogold Negative Staining,
1° α - 80, 2° α - mouse gold particles 10nm)



L.lactis + AI-1

+

L.lactis

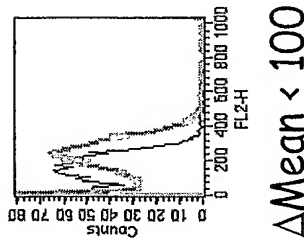
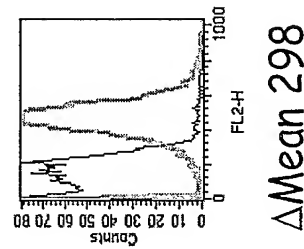
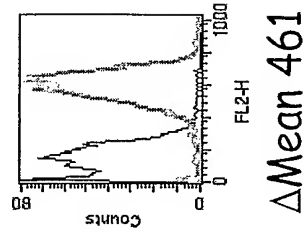
-

Figure 169

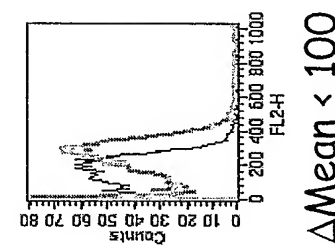
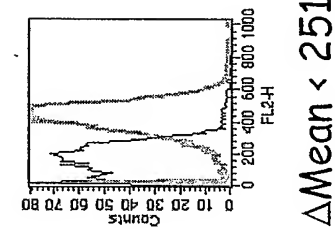
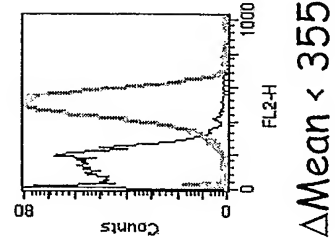
GBS JM9130013

L. lactis + AI-1

L. lactis



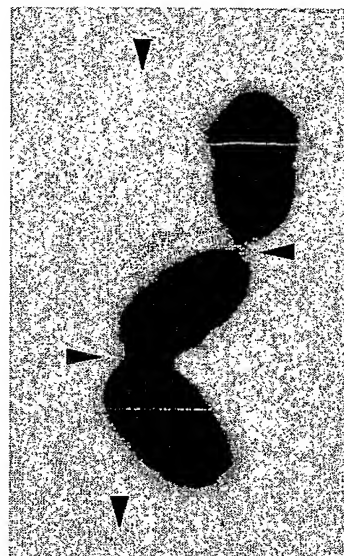
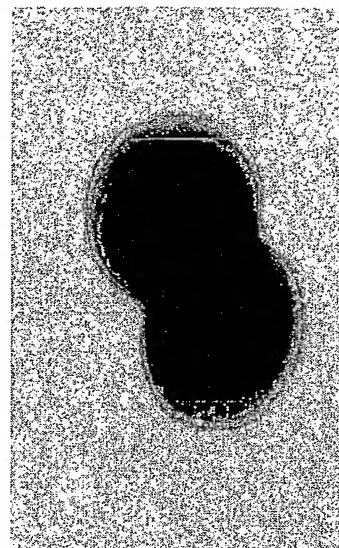
α -80



α -104

Figure 170

Phase contrast Microscopy Immuno-electronmicroscopy
(Immunogold Negative Staining,
1° α -80, 2° α -mouse gold particles 10nm)



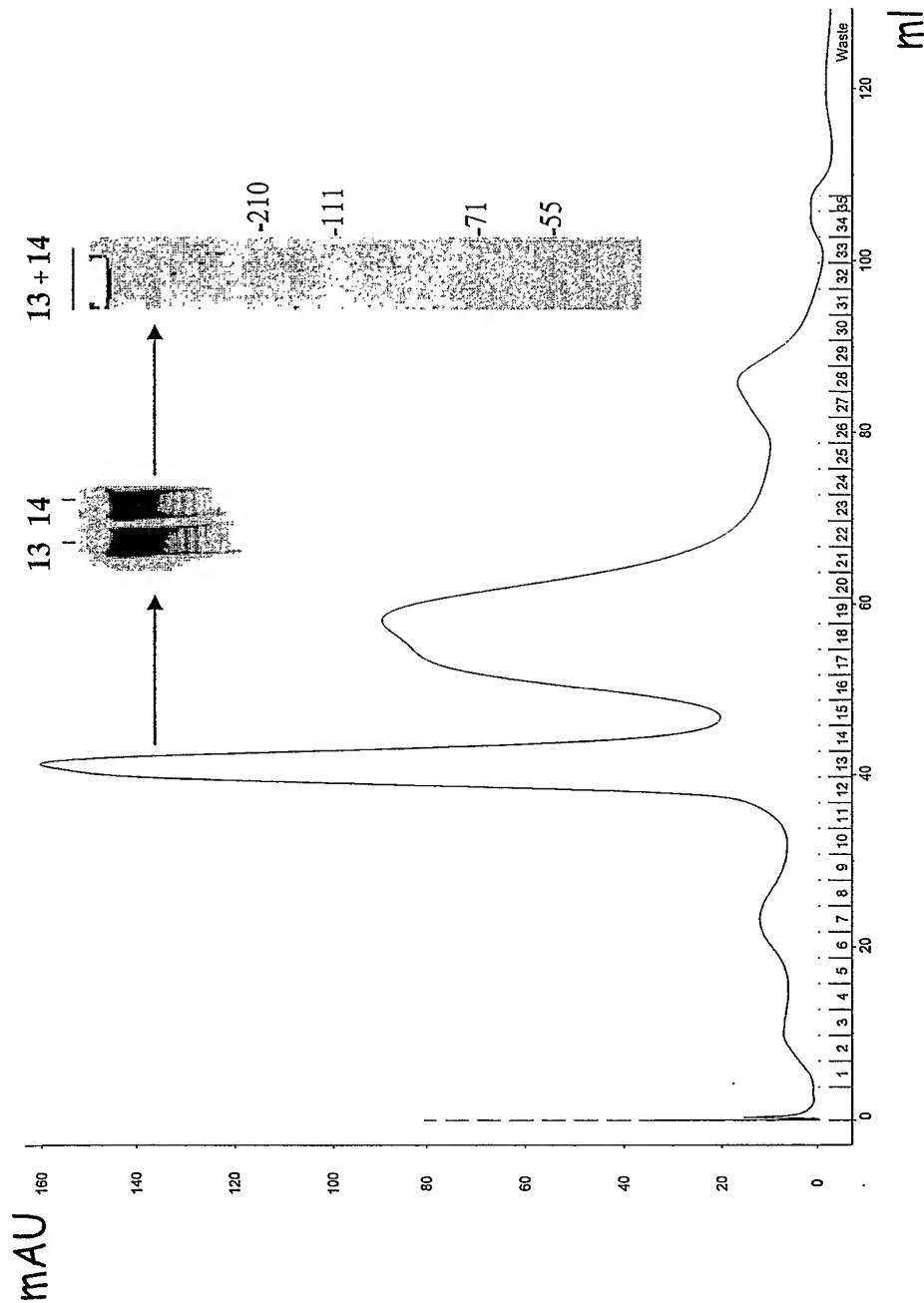
L. lactis

L. lactis + AI-1

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Figure 171

Gel filtration on Sepharyl HR 400



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Figure 172

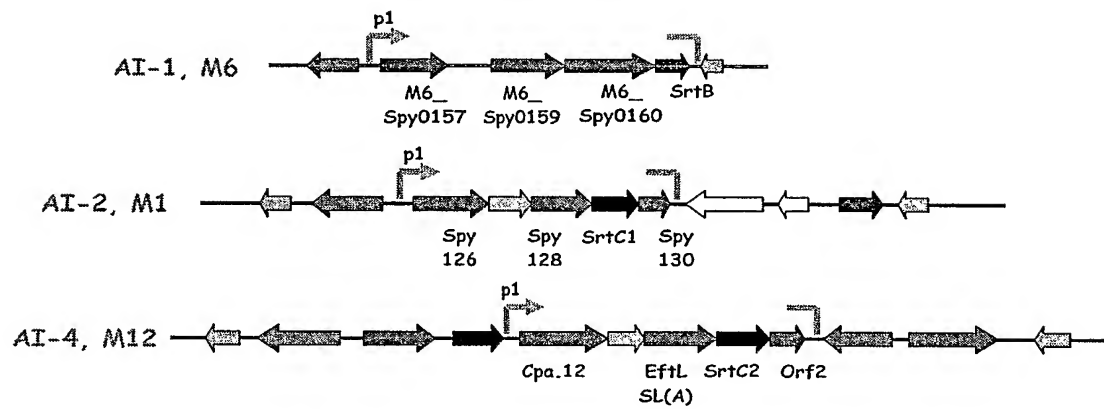
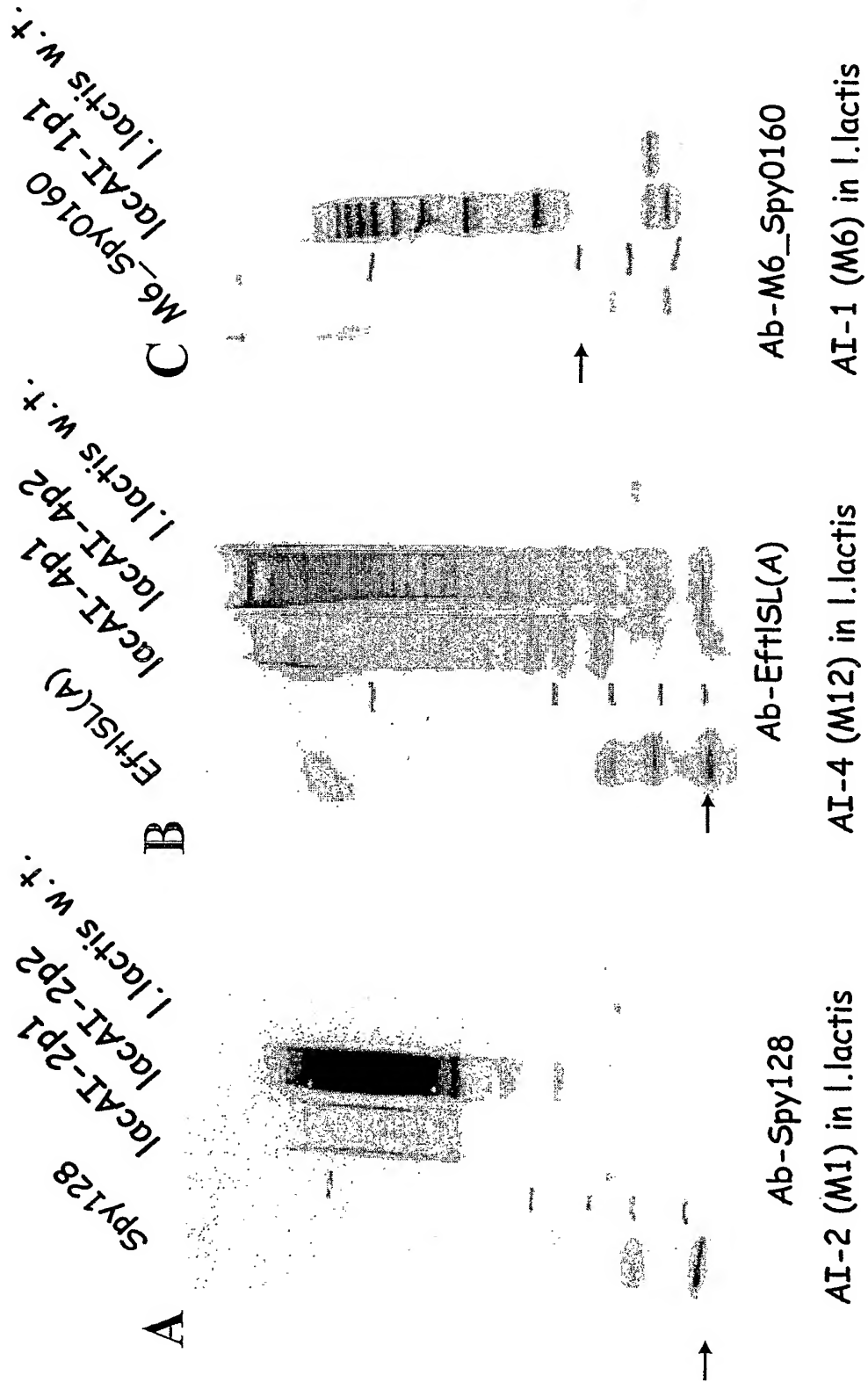


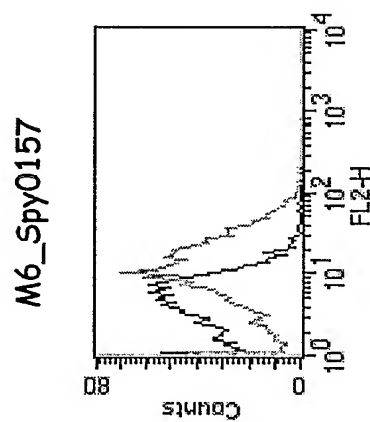
Figure 173



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Figure 174



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Figure 175

Orf2

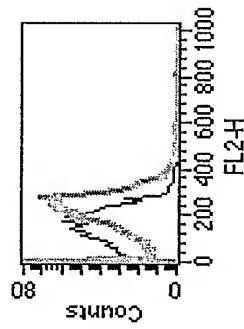
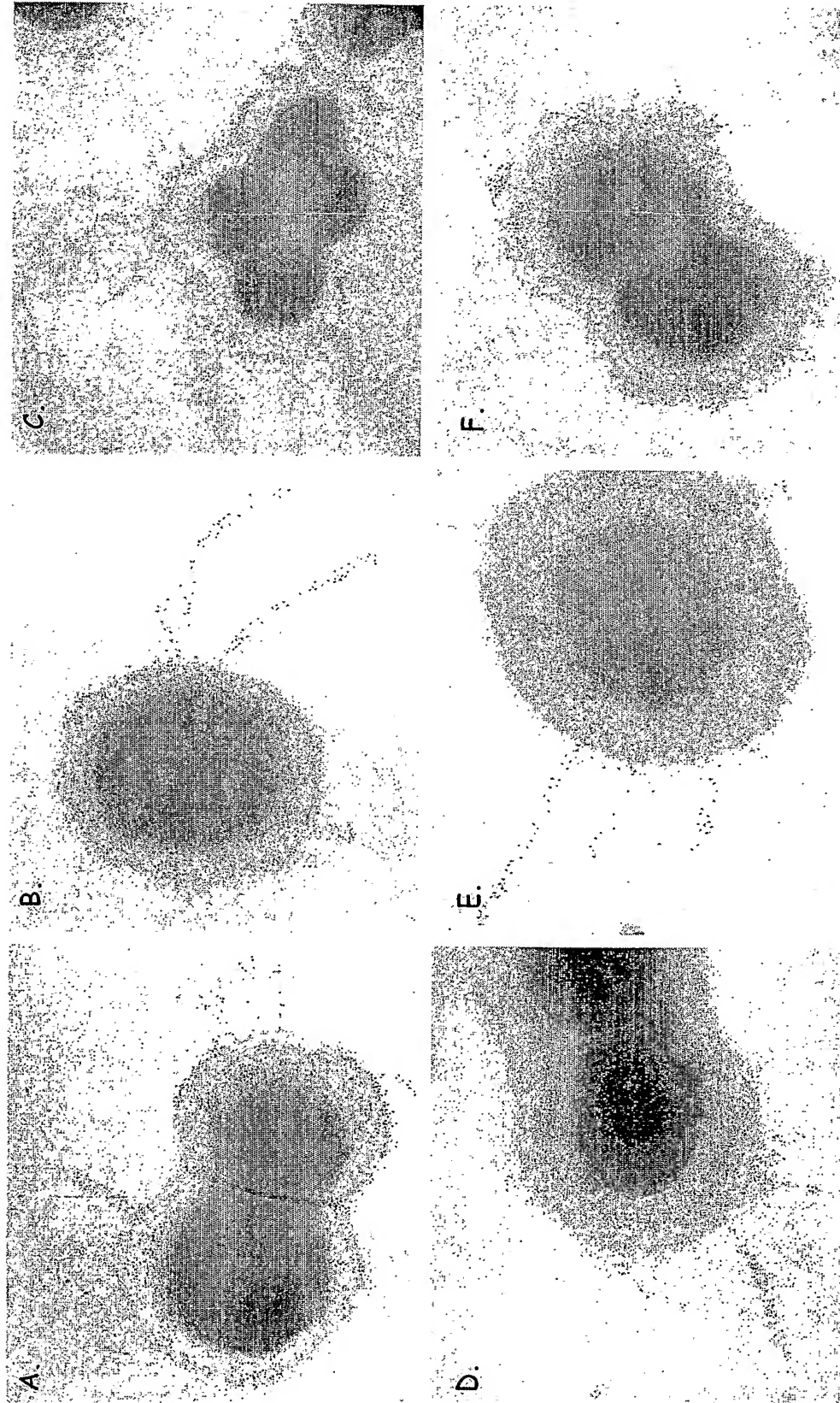


Figure 176



Immunogold labeling with antibodies against: A. B. C. D. E. M6_Spy0160; F. M6_Spy0159

Figure 177

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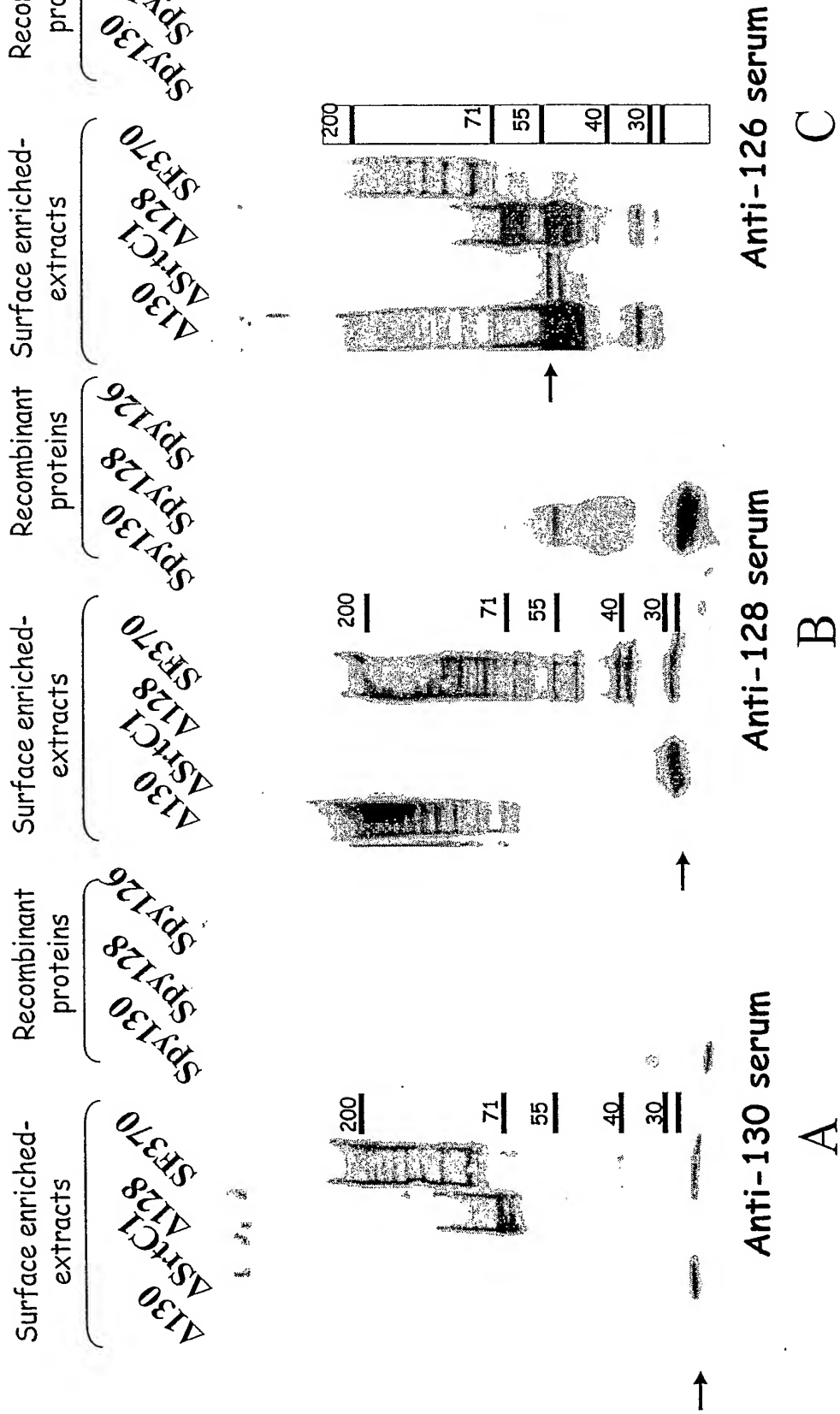
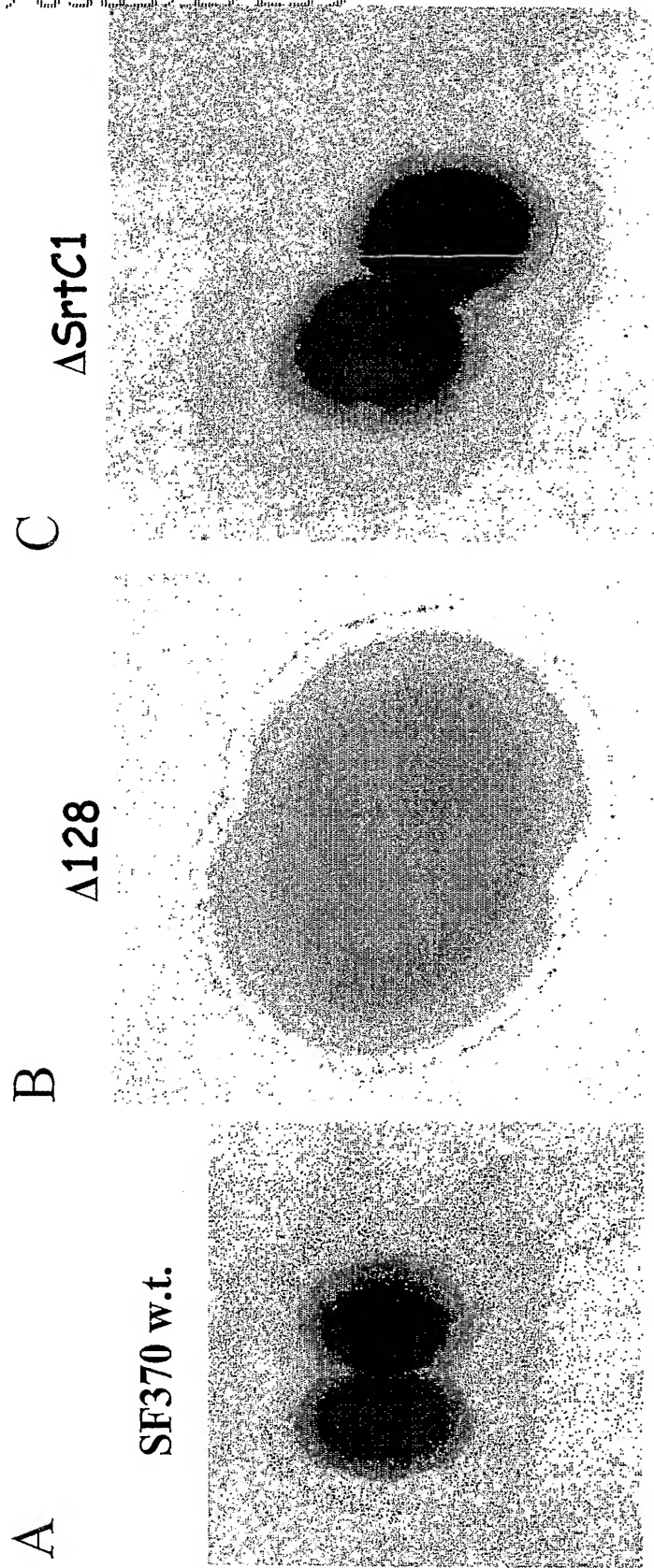


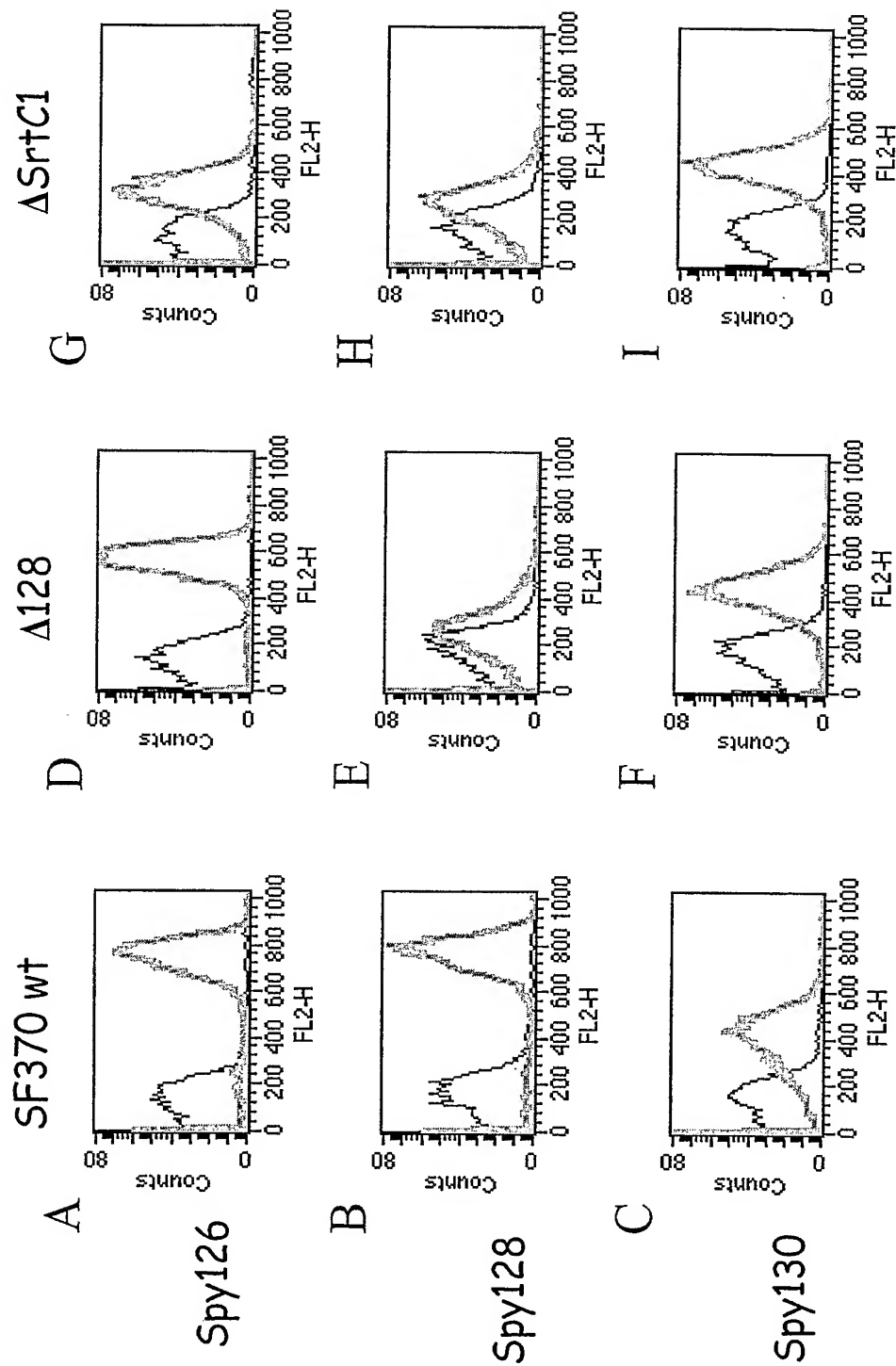
Figure 178



Immuno-gold labeling with sera against Spy128

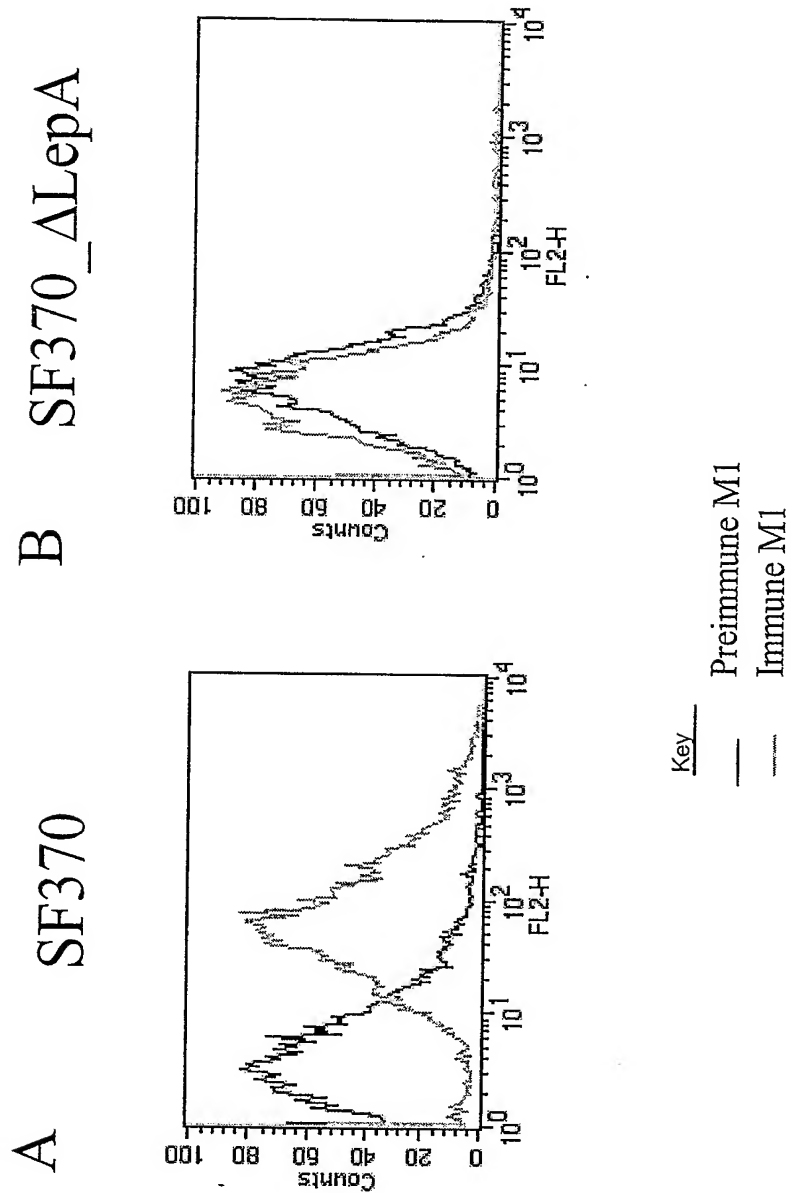
Comparison of wild type and mutant strain by Immunoelectron Microscopy show that Spy128- or SrtC1-lacking bacteria are not able to assemble pili. SrtC1, therefore, is absolutely required for pilus assembly but not for surface anchoring.

Figure 179



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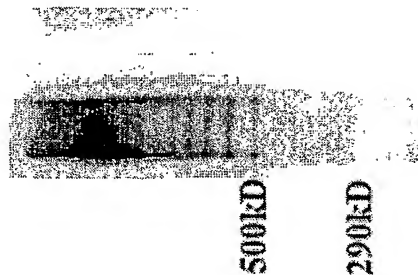
Figure 180



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Figure 181

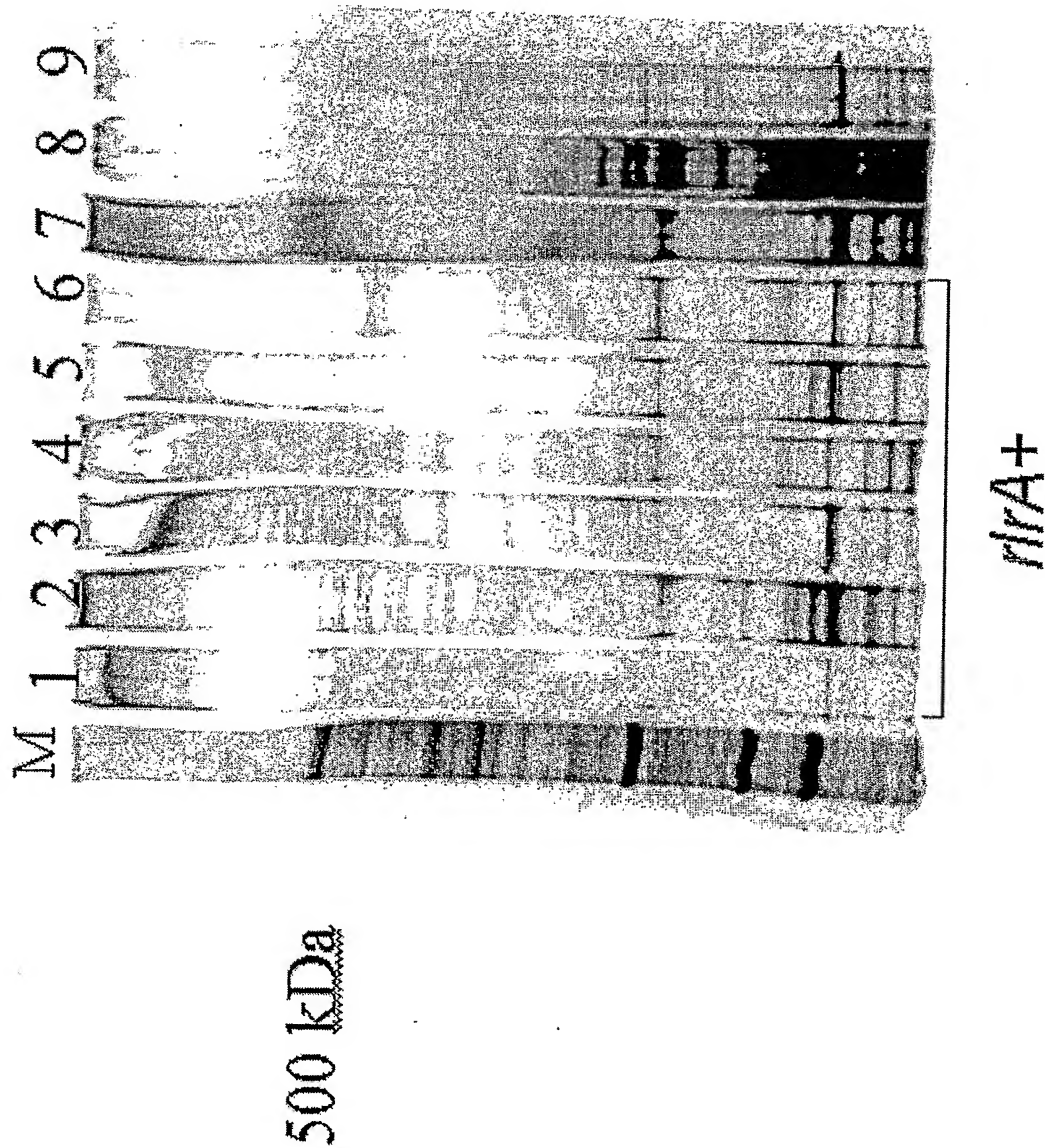
T4
T4Δ(ttgA-si)



Pili form high molecular weight
polymers in gradient SDS-PAGE gels

α -RrgB

Figure 182



1. TIGR4
2. 19A Hungary-6
3. 6B Finland-12
4. 6B IJ
5. 9V Spain-3
6. 23F Taiwan-15
7. 19F IJ
8. 1 IJ
9. D39

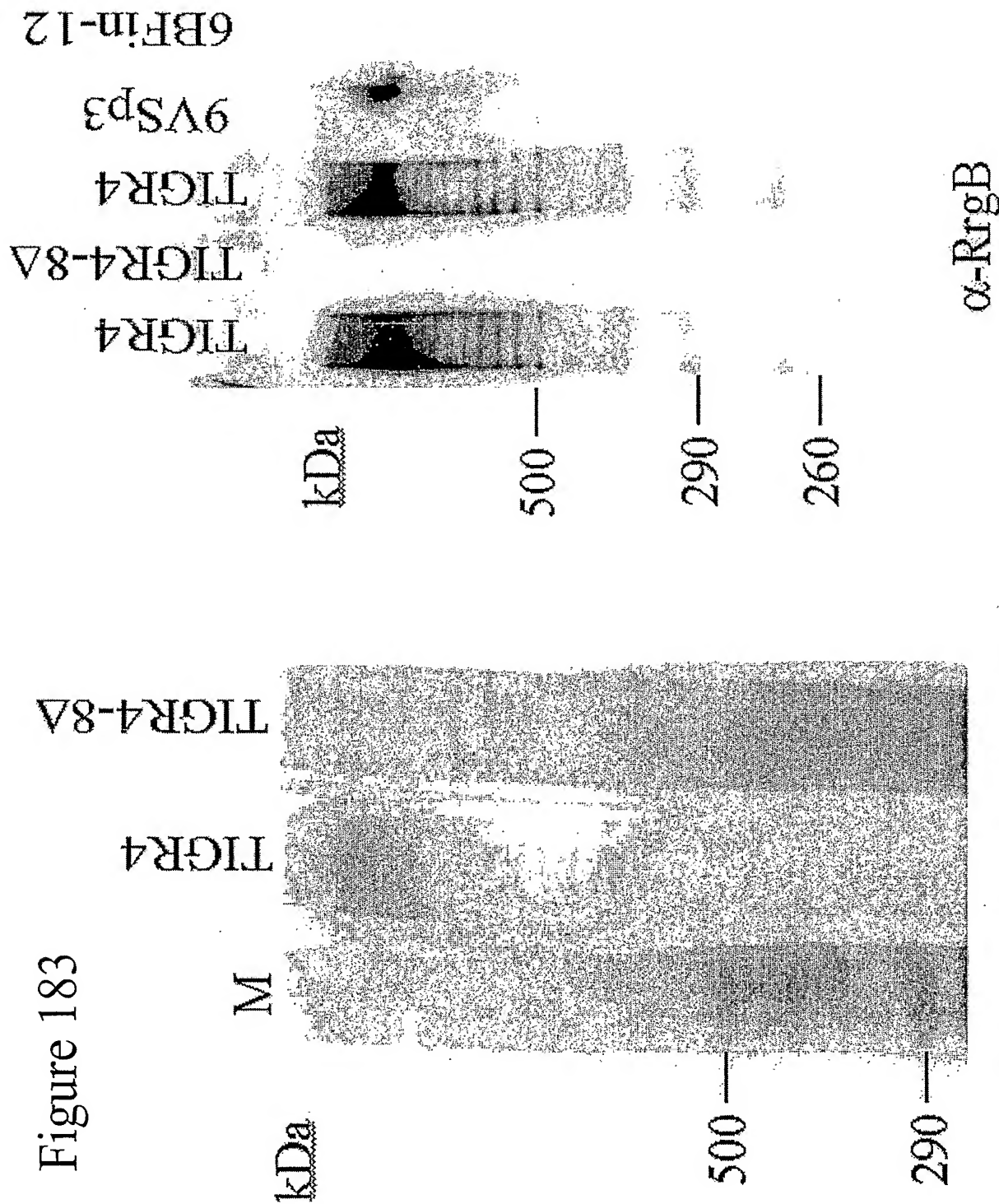


Figure 183

Silver stained gel 3-8%

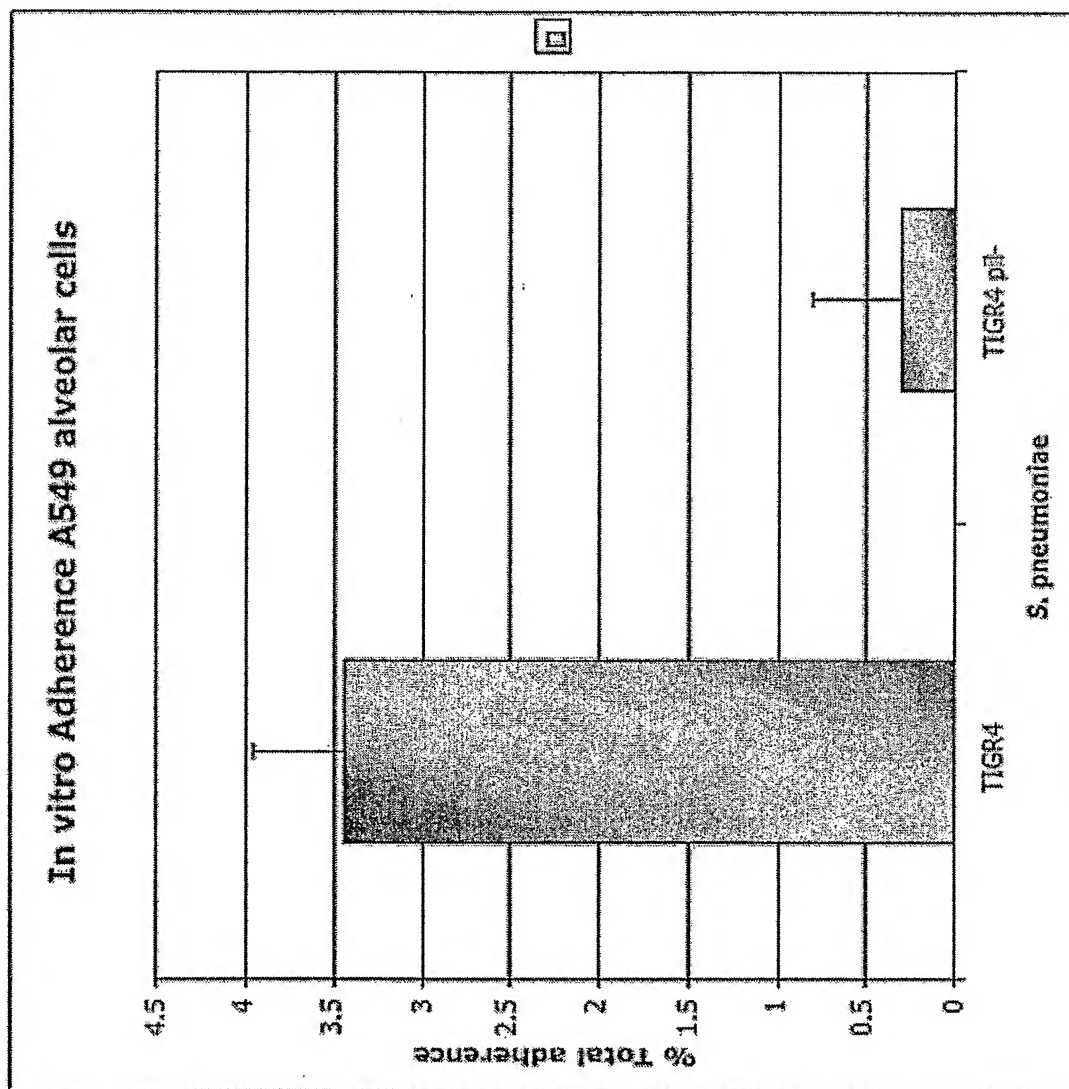
α -RrgB

Anti-RrgB TIGR4 recognized the 9v pili

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Figure 184



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Figure 185



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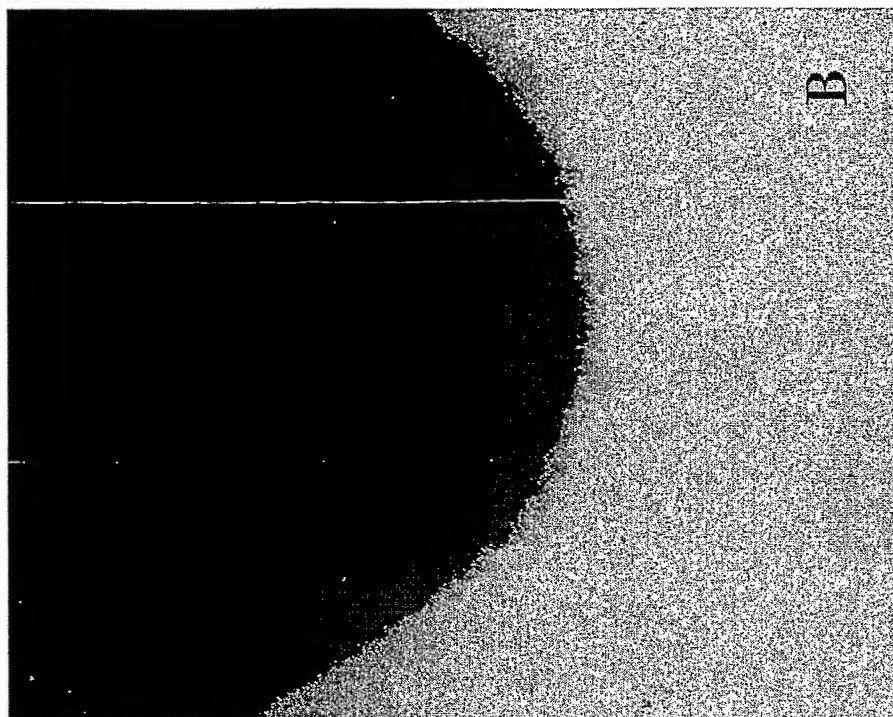


Figure 186

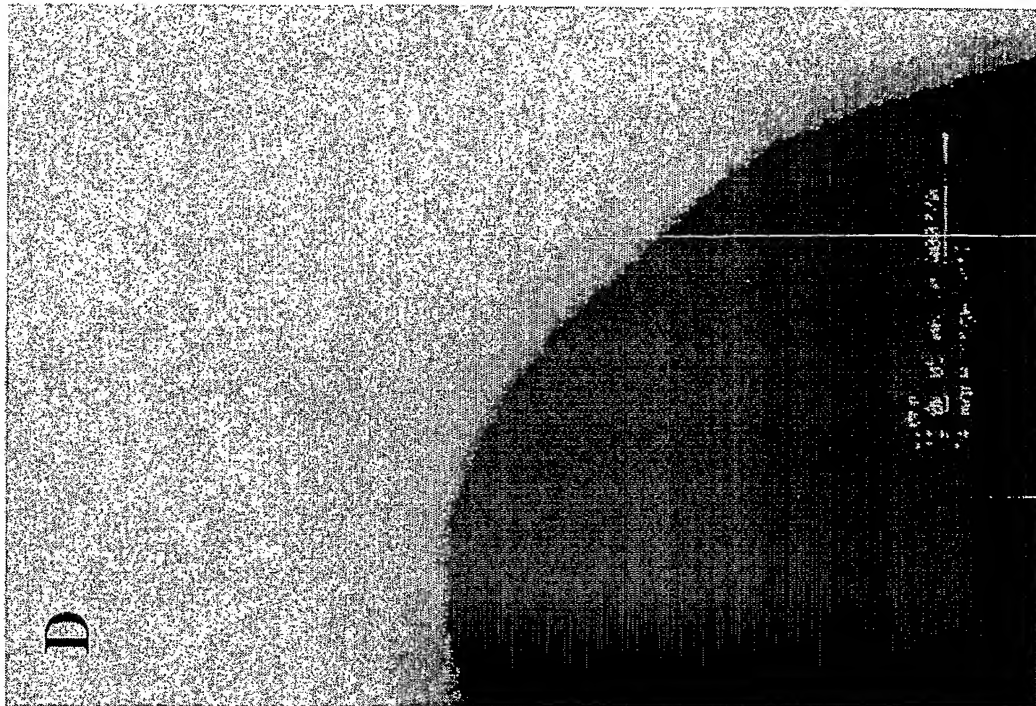


Figure 188

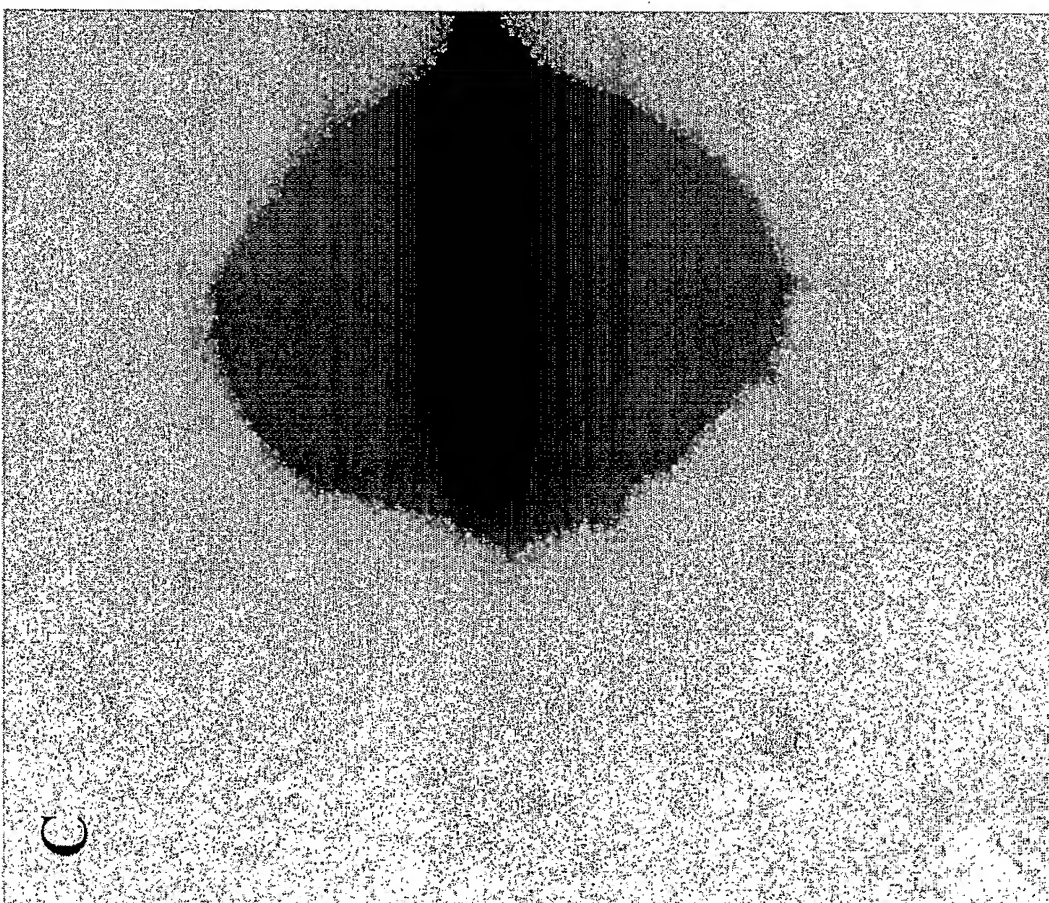


Figure 187

Figure 189

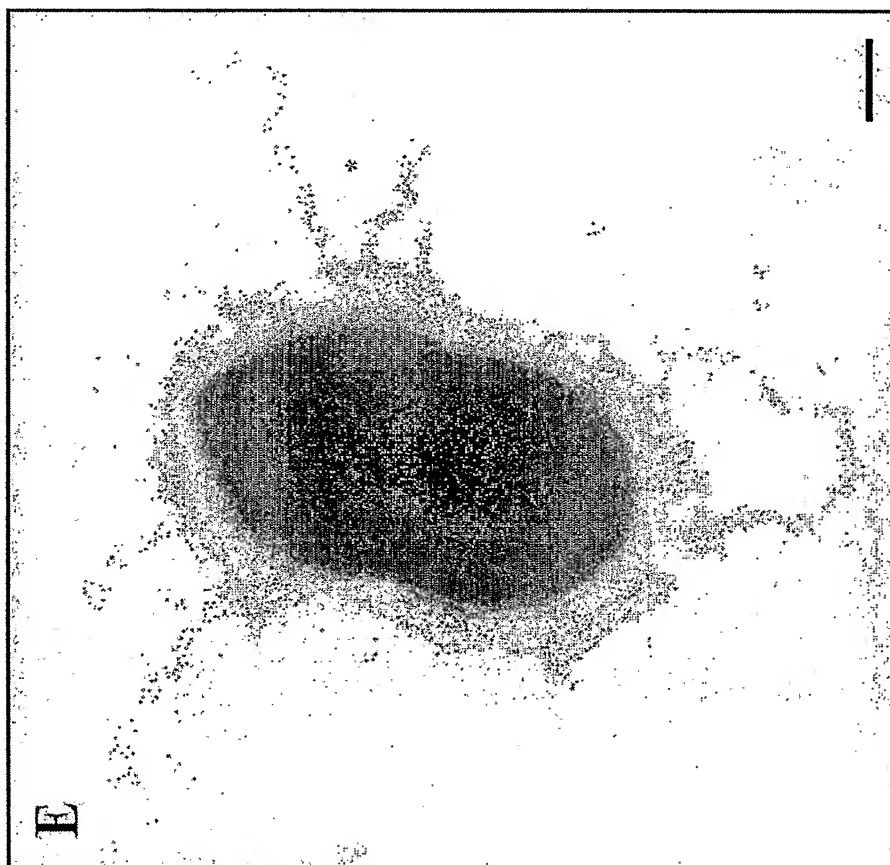


Figure 190

S. pneumoniae pili proteins: sp0462 (Rrg.A)

Expression and purification:

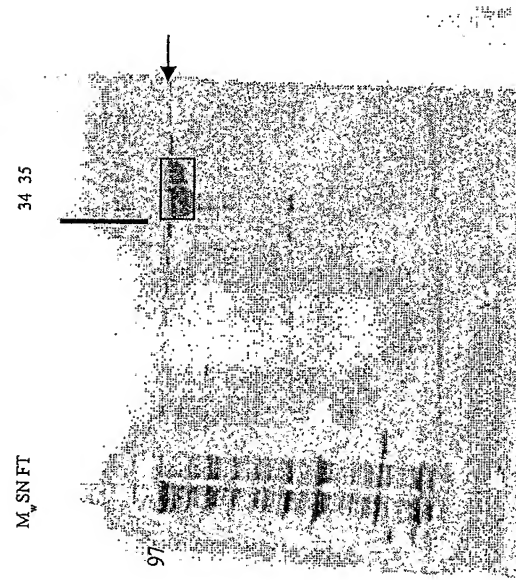
- pET 21b+-*rrg.A-6*
- purified in soluble form (stored at -80°C ; in $\text{NaCl}_{\text{physiol.}}$)



Results:

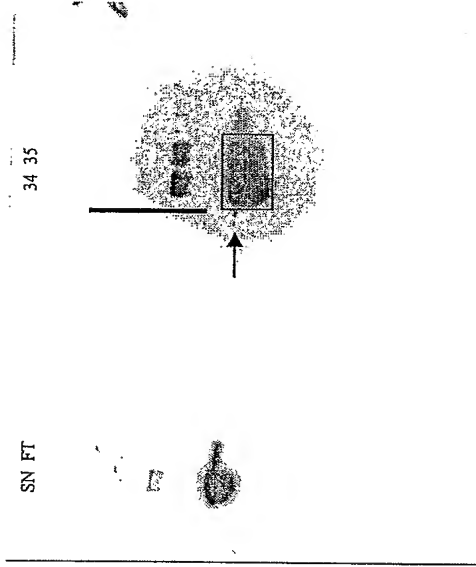
- protein conc.: 1,1 mg/ml

A



SDS-page

B



Western blot (anti-HIS)

S. pneumoniae pili proteins – antibody production (mice)

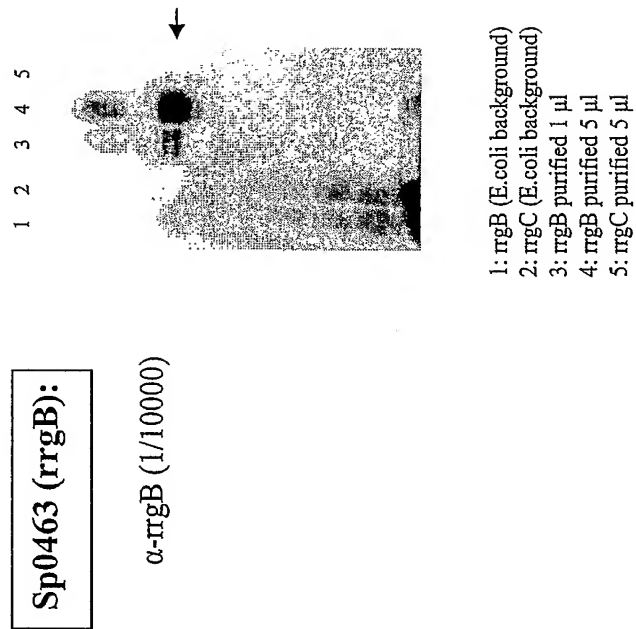


Figure 191

S. pneumoniae pili proteins – antibody production (mice)

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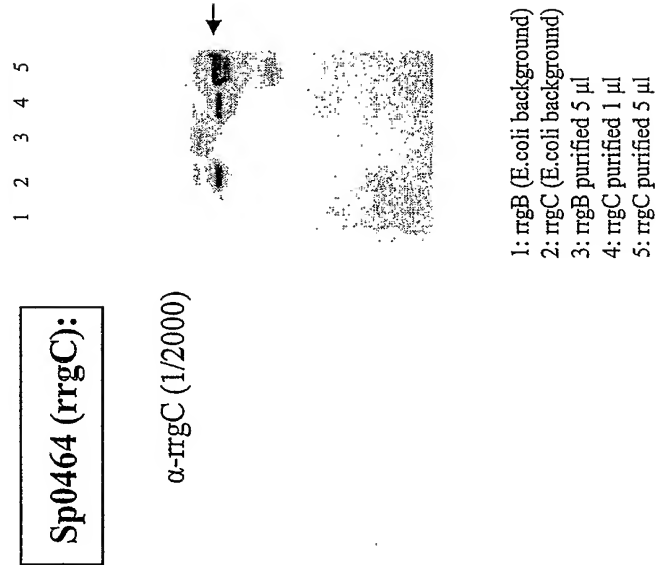


Figure 192

S. pneumoniae TIGR4 pilus purification I – cultivation + digestion

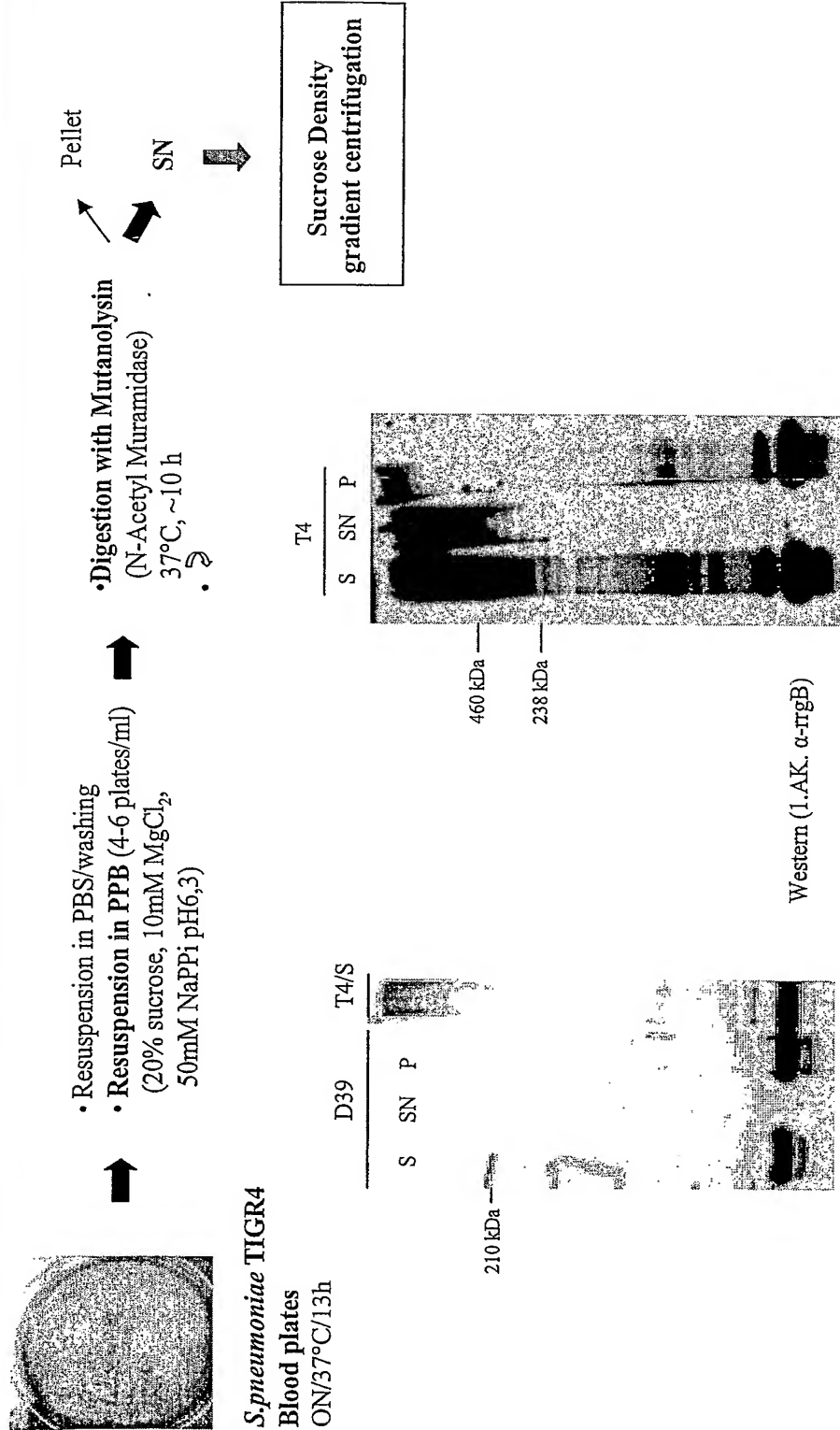


Figure 193

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S. pneumoniae TIGR4 pilus purification II - Sucrose density gradient centrifugation

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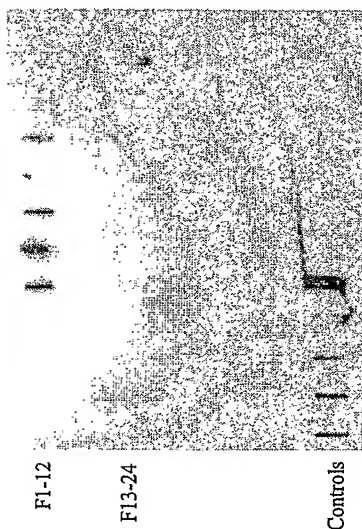
950µl SN
25-56% linear sucrose gradient
SW40; 38000, 4°C, 16h



24 x 500 µl fractions
(Gradient master)

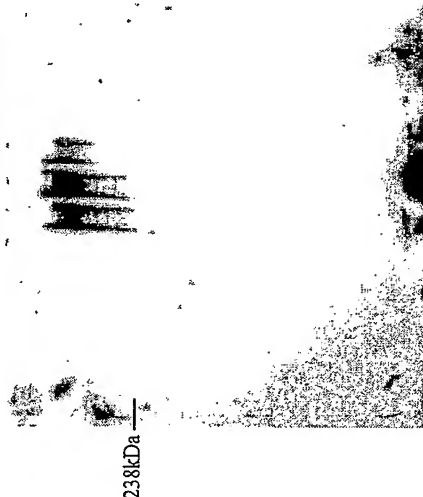


Gel filtration

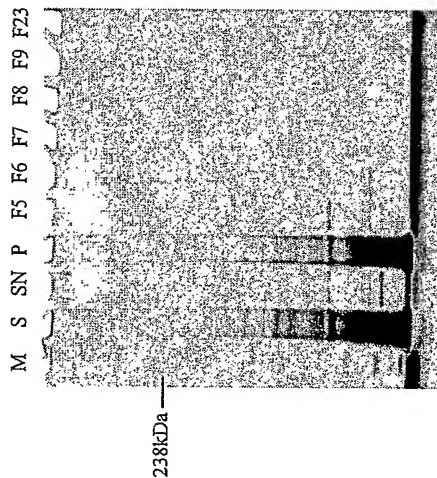


Slot blot (fractions sucrose grad.)

F3 F4 F5 F6 F7

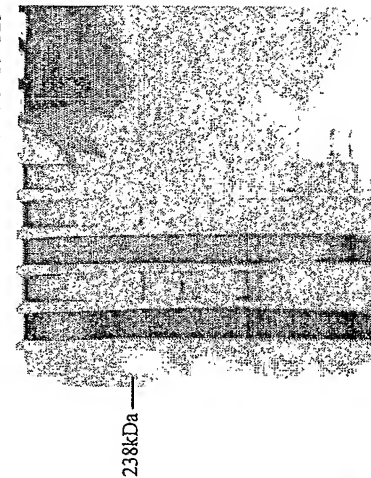


Western (I.A.K. α-rrgB)



Coomassie staining

M S SN P F5 F6 F7 F8 F9 F23



Silver Staining

Figure 194

400 μ l Fr.5
Superdex 200

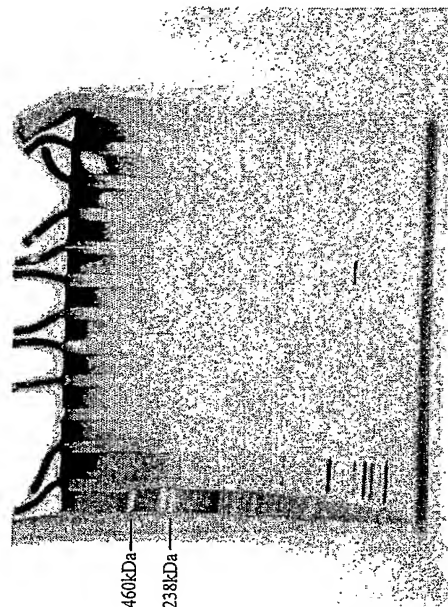
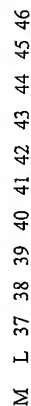
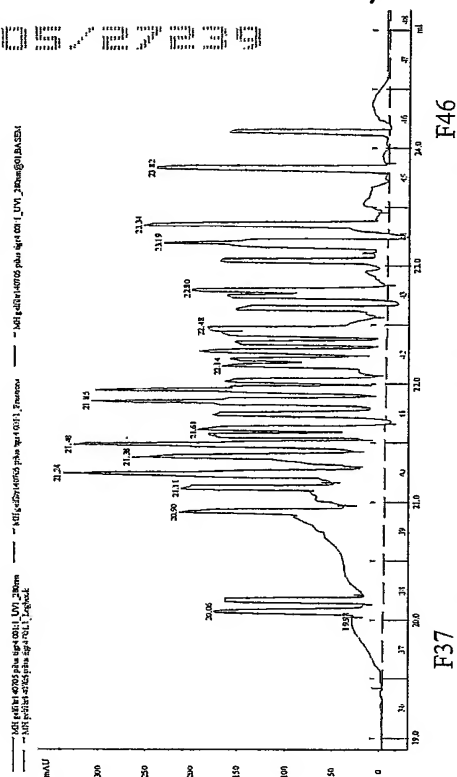
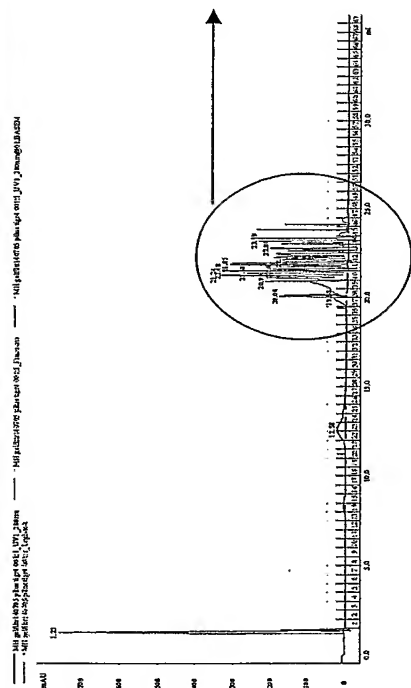


Figure 195

PCT/US2005/027239

14CSR -----GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
670 TGAGTTGTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
6BF -----GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
6BSP -----GCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
19AH -----GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
23FPO -----TTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
19FTW -----TTTTTCATTATAAATCTTATGGGACTTTTTTGATACTCAAAAAGC
9VSP -----TTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
TIGR4 -----TTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
23FTW -----GCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC

14CSR CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT
670 CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT
6BF CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT
6BSP CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT
19AH CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT
23FPO CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT
19FTW CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT
9VSP CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT
TIGR4 CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT
23FTW CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAACACT

14CSR TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC
670 TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC
6BF TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC
6BSP TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC
19AH TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC
23FPO TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC
19FTW TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC
9VSP TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC
TIGR4 TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC
23FTW TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCTGTTTACCCAAAAC

14CSR TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG
670 TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG
6BF TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG
6BSP TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG
19AH TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG
23FPO TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG
19FTW TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG
9VSP TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG
TIGR4 TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG
23FTW TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCCTTTTGTGTGTAGACAG

14CSR TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA
670 TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA
6BF TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA
6BSP TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA
19AH TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA
23FPO TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA
19FTW TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA
9VSP TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA
TIGR4 TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA
23FTW TACGATGAACCTATAACAAATAGTGAGCCTTTTGTAGCAATCATTCGACCCGTTTGTCAA

Figure 196A

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14CSR AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
670 AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
6BF AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
6BSP AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
19AH AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
23FPO AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
19FTW AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
9VSP AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
TIGR4 AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
23FTW AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA

14CSR AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
670 AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
6BF AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
6BSP AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
19AH AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
23FPO AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
19FTW AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
9VSP AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
TIGR4 AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
23FTW AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG

14CSR GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
670 GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
6BF GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
6BSP GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
19AH GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
23FPO GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
19FTW GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
9VSP GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
TIGR4 GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
23FTW GCAGGTATTCTTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG

14CSR GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
670 GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
6BF GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
6BSP GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
19AH GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
23FPO GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
19FTW GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
9VSP GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
TIGR4 GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
23FTW GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA

14CSR AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAATCGGGA
670 AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAATCGGGA
6BF AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAATCGGGA
6BSP AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAATCGGGA
19AH AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAATCGGGA
23FPO AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAATCGGGA
19FTW AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAATCGGGA
9VSP AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAATCGGGA
TIGR4 AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAATCGGGA
23FTW AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAATCGGGA

Figure 196B

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14CSR TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
670 TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
6BF TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
6BSP TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
19AH TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
23FPO TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
19FTW TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
9VSP TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
TIGR4 TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
23FTW TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT

14CSR GCTGGTCGATAAECTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
670 GCTGGTCGATAAECTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
6BF GCTGGTCGATAAECTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
6BSP GCTGGTCGATAAECTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
19AH GCTGGTCGATAAECTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
23FPO GCTGGTCGATAAECTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
19FTW GCTGGTCGATAAECTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
9VSP GCTGGTCGATAAECTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
TIGR4 GCTGGTCGATAAECTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG
23FTW GCTGGTCGATAAECTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTCG

14CSR AAATATGATACAGTGGCTTGTCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
670 AAATATGATACAGTGGCTTGTCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
6BF AAATATGATACAGTGGCTTGTCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
6BSP AAATATGATACAGTGGCTTGTCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
19AH AAATATGATACAGTGGCTTGTCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
23FPO AAATATGATACAGTGGCTTGTCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
19FTW AAATATGATACAGTGGCTTGTCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
9VSP AAATATGATACAGTGGCTTGTCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
TIGR4 AAATATGATACAGTGGCTTGTCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
23FTW AAATATGATACAGTGGCTTGTCGCTTCAATCCCATAATGTTTCGTAATAATTATAATAGG

14CSR GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
670 GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
6BF GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
6BSP GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
19AH GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
23FPO GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
19FTW GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
9VSP GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
TIGR4 GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
23FTW GAACTAGATTTTGTAAACCAAACAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA

14CSR AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT
670 AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT
6BF AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT
6BSP AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT
19AH AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT
23FPO AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT
19FTW AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT
9VSP AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT
TIGR4 AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT
23FTW AAGAAAGAGAATTTCGAAATGTCATTTCTTAAGATATTCTTGAACCTGGATAGTAGATGCT

Figure 196C

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14CSR TTCCTCTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTCTTGATTCCATT
670 TTCCTCTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTCTTGATTCCATT
6BF TTCCTCTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTCTTGATTCCATT
6BSP TTCCTCTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTCTTGATTCCATT
19AH TTCCTCTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTCTTGATTCCATT
23FPO TTCCTCTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTCTTGATTCCATT
19FTW TTCCTCTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTCTTGATTCCATT
9VSP TTCCTCTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTCTTGATTCCATT
TIGR4 TTCCTCTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTCTTGATTCCATT
23FTW TTCCTCTGTATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTCTTGATTCCATT

14CSR TGTCTTGGAAAACGAAGAATTAGCAGAACATAAACCAAAAAGATATAATCCAGTTCTT
670 TGTCTTGGAAAACGAAGAATTAGCAGAACATAAACCAAAAAGATATAATCCAGTTCTT
6BF TGTCTTGGAAAACGAAGAATTAGCAGAACATAAACCAAAAAGATATAATCCAGTTCTT
6BSP TGTCTTGGAAAACGAAGAATTAGCAGAACATAAACCAAAAAGATATAATCCAGTTCTT
19AH TGTCTTGGAAAACGAAGAATTAGCAGAACATAAACCAAAAAGATATAATCCAGTTCTT
23FPO TGTCTTGGAAAACGAAGAATTAGCAGAACATAAACCAAAAAGATATAATCCAGTTCTT
19FTW TGTCTTGGAAAACGAAGAATTAGCAGAACATAAACCAAAAAGATATAATCCAGTTCTT
9VSP TGTCTTGGAAAACGAAGAATTAGCAGAACATAAACCAAAAAGATATAATCCAGTTCTT
TIGR4 TGTCTTGGAAAACGAAGAATTAGCAGAACATAAACCAAAAAGATATAATCCAGTTCTT
23FTW TGTCTTGGAAAACGAAGAATTAGCAGAACATAAACCAAAAAGATATAATCCAGTTCTT

14CSR CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
670 CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
6BF CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
6BSP CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
19AH CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
23FPO CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
19FTW CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
9VSP CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
TIGR4 CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
23FTW CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA

14CSR TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
670 TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
6BF TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
6BSP TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
19AH TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
23FPO TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
19FTW TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
9VSP TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
TIGR4 TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
23FTW TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG

14CSR GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
670 GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
6BF GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
6BSP GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
19AH GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
23FPO GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
19FTW GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
9VSP GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
TIGR4 GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
23FTW GAAATTCCCGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG

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14CSR GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
670 GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
6BF GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
6BSP GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
19AH GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
23FPO GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
19FTW GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
9VSP GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
TIGR4 GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
23FTW GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA

14CSR CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
670 CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
6BF CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
6BSP CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
19AH CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
23FPO CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
19FTW CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
9VSP CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
TIGR4 CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA
23FTW CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAAATGAAACTGGAGGA

14CSR GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA
670 GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA
6BF GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA
6BSP GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA
19AH GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA
23FPO GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA
19FTW GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA
9VSP GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA
TIGR4 GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA
23FTW GTGCAATTAAAAACGAATGCGATATT CAGGACCAACTACTTGATTTTTT CACAAGGTCCA

14CSR AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG
670 AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG
6BF AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG
6BSP AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG
19AH AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG
23FPO AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG
19FTW AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG
9VSP AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG
TIGR4 AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG
23FTW AACCTACTGAACGTAGTAACAAGCCACACTTTTGTGTCGACGCGGTAGCCTGTTGCGATGG

14CSR AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC
670 AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC
6BF AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC
6BSP AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC
19AH AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC
23FPO AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC
19FTW AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC
9VSP AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC
TIGR4 AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC
23FTW AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAGAAGC

Figure 196E

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14CSR GGAGTATTTTTAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
670 GGAGTATTTTTAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
6BF GGAGTATTTTTAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
6BSP GGAGTATTTTTAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
19AH GGAGTATTTTTAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
23FPO GGAGTATTTTTAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
19FTW GGAGTATTTTTAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
9VSP GGAGTATTTTTAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
TIGR4 GGAGTATTTTTAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
23FTW GGAGTATTTTTAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT

14CSR GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
670 GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
6BF GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
6BSP GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
19AH GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
23FPO GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
19FTW GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
9VSP GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
TIGR4 GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT
23FTW GAGAATGGTGTTCGATTAAATGAACCTGTTGCGTATCTAAATTAAATGTCAACTCTTCCT

14CSR CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
670 CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
6BF CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
6BSP CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
19AH CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
23FPO CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
19FTW CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
9VSP CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
TIGR4 CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
23FTW CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA

14CSR AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAATGGTAA
670 AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAATGGTAA
6BF AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAATGGTAA
6BSP AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAATGGTAA
19AH AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAATGGTAA
23FPO AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAATGGTAA
19FTW AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAATGGTAA
9VSP AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAATGGTAA
TIGR4 AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAATGGTAA
23FTW AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAATGGTAA

14CSR TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
670 TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
6BF TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
6BSP TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
19AH TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
23FPO TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
19FTW TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
9VSP TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
TIGR4 TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
23FTW TTTTATCTGTAATTCCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC

Figure 196F

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14CSR ATATAGATAATTTTAAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
670 ATATAGATAATTTTAAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
6BF ATATAGATAATTTTAAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
6BSP ATATAGATAATTTTAAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
19AH ATATAGATAATTTTAAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
23FPO ATATAGATAATTTTAAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
19FTW ATATAGATAATTTTAAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
9VSP ATATAGATAATTTTAAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
TIGR4 ATATAGATAATTTTAAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
23FTW ATATAGATAATTTTAAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG

14CSR TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
670 TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
6BF TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
6BSP TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
19AH TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
23FPO TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
19FTW TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
9VSP TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
TIGR4 TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
23FTW TGGAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA

14CSR TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT
670 TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT
6BF TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT
6BSP TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT
19AH TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT
23FPO TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT
19FTW TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT
9VSP TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT
TIGR4 TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT
23FTW TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTATCAAAAT

14CSR ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
670 ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
6BF ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
6BSP ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
19AH ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
23FPO ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
19FTW ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
9VSP ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
TIGR4 ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
23FTW ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA

14CSR TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
670 TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
6BF TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
6BSP TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
19AH TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
23FPO TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
19FTW TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
9VSP TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
TIGR4 TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
23FTW TTTATACTAGGATAGTTAATAGTAATACTATACTATACTA-----TATTGTATACAAGTGTGTCA

Figure 196G

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14CSR TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT
670 TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT
6BF TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT
6BSP TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT
19AH TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT
23FPO TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT
19FTW TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT
9VSP TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT
TIGR4 TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT
23FTW TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTAGT

14CSR GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
670 GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
6BF GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
6BSP GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
19AH GAACGGATTAACCTCAGCATGAGATAAATTTTATCAGAA--TAAGTAATCCGTTTCTTCGT
23FPO GAACGGATTAACCTCAGCATGAGATAAATTTTATCAGAA--TAAGTAATCCGTTTCTTCGT
19FTW GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
9VSP GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
TIGR4 GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
23FTW GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT

14CSR GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCATGAATAATGC
670 GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCATGAATAATGC
6BF GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCATGAATAATGC
6BSP GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCATGAATAATGC
19AH GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCATGAATAATGC
23FPO GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCATGAATAATGC
19FTW GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCATGAATAATGC
9VSP GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCATGAATAATGC
TIGR4 GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCATGAATAATGC
23FTW GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCATGAATAATGC

14CSR TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
670 TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
6BF TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
6BSP TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
19AH TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
23FPO TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
19FTW TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
9VSP TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
TIGR4 TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
23FTW TTAACAGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC

14CSR TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTTAGCAGAAACGCCTG
670 TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTTAGCAGAAACGCCTG
6BF TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTTAGCAGAAACGCCTG
6BSP TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTTAGCAGAAACGCCTG
19AH TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTTAGCAGAAACGCCTG
23FPO TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTTAGCAGAAACGCCTG
19FTW TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTTAGCAGAAACGCCTG
9VSP TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTTAGCAGAAACGCCTG
TIGR4 TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTTAGCAGAAACGCCTG
23FTW TGTGCTGTATATCTCAGTTGACAGCTTTTCTTCGATAGTTGCTTTTAGCAGAAACGCCTG

Figure 196H

PCT/US05/27239

14CSR AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
670 AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
6BF AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
6BSP AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
19AH AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
23FPO AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
19FTW AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
9VSP AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
TIGR4 AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
23FTW AAACCCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC

14CSR TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
670 TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
6BF TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
6BSP TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
19AH TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
23FPO TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
19FTW TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
9VSP TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGAATGGCACAACCTGTTTCGCAAAGGA
TIGR4 TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
23FTW TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA

14CSR CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
670 CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
6BF CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
6BSP CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
19AH CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
23FPO CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
19FTW CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
9VSP CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
TIGR4 CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
23FTW CAGAGGCGCAAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA

14CSR CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
670 CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
6BF CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
6BSP CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
19AH CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
23FPO CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
19FTW CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
9VSP CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAACGGACTGTTGAAGTTG
TIGR4 CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
23FTW CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG

14CSR AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
670 AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
6BF AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
6BSP AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
19AH AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
23FPO AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
19FTW AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
9VSP AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
TIGR4 AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
23FTW AGAAGAATGGTTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT

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14CSR      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
670         CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
6BF         CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
6BSP       CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
19AH       CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
23FPO      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
19FTW      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
9VSP       CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
TIGR4      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
23FTW      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
*****

14CSR      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
670         AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
6BF         AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
6BSP       AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
19AH       AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
23FPO      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
19FTW      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
9VSP       AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
TIGR4      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
23FTW      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
*****

14CSR      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
670         GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
6BF         GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
6BSP       GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
19AH       GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
23FPO      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
19FTW      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
9VSP       GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
TIGR4      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
23FTW      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
*****

14CSR      ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT
670         ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT
6BF         ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT
6BSP       ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT
19AH       ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT
23FPO      ACCAATATGGAATCGAGTTGACGGTTAGTGGTAAAACGACGGTTGAAACGAAAGAAGCCT
19FTW      ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT
9VSP       ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT
TIGR4      ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT
23FTW      ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT
*****

14CSR      CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
670         CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
6BF         CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
6BSP       CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
19AH       CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
23FPO      CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
19FTW      CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
9VSP       CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTTCGAA
TIGR4      CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTTCGAA
23FTW      CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTTCGAA
**      *****

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Figure 196J

SECRET

14CSR ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGCACACGAGCCCTTGTAGATAAAG
 670 ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGCACACGAGCCCTTGTAGATAAAG
 6BF ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGCACACGAGCCCTTGTAGATAAAG
 6BSP ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGCACACGAGCCCTTGTAGATAAAG
 19AH ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGCACACGAGCCCTTGTAGATAAAG
 23FPO ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGCACACGAGCCCTTGTAGATAAAG
 19FTW ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCACACGTTCTCTATTGATAAAA
 9VSP ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCACACGTTCTCTATTGATAAAA
 TIGR4 ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCACACGTTCTCTATTGATAAAA
 23FTW ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCACACGTTCTCTATTGATAAAA
 * * * **** * ** ***** ** * * * ***** * *** * **** *

 14CSR TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCCTTTGACG
 670 TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCCTTTGACG
 6BF TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCCTTTGACG
 6BSP TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCCTTTGACG
 19AH TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCCTTTGACG
 23FPO TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCCTTTGACG
 19FTW TTACATCTGATCCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCCTTTGATG
 9VSP TTACATCTGATCCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCCTTTGATG
 TIGR4 TTACATCTGATCCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCCTTTGATG
 23FTW TTACATCTGATCCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCCTTTGATG
 **** ** * **** ** * ***** ***** ***** ** ***** ** *

 14CSR GTTTCAGAAGCTACTGTGGA AAAAGGGGTAGCAGATGCGAACGGA AAAAATATTGAATGACT
 670 GTTTCAGAAGCTACTGTGGA AAAAGGGGTAGCAGATGCGAACGGA AAAAATATTGAATGACT
 6BF GTTTCAGAAGCTACTGTGGA AAAAGGGGTAGCAGATGCGAACGGA AAAAATATTGAATGACT
 6BSP GTTTCAGAAGCTACTGTGGA AAAAGGGGTAGCAGATGCGAACGGA AAAAATATTGAATGACT
 19AH GTTTCAGAAGCTACTGTGGA AAAAGGGGTAGCAGATGCGAACGGA AAAAATATTGAATGACT
 23FPO GTTTCAGAAGCTACTGTGGA AAAAGGGGTAGCAGATGCGAACGGA AAAAATATTGAATGACT
 19FTW GGACCAGATTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGA AACGATTGAATGATT
 9VSP GGACCAGATTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGA AACGATTGAATGATT
 TIGR4 GGACCAGATTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGA AACGATTGAATGATT
 23FTW GGACCAGATTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGA AACGATTGAATGATT
 * * * *** ** ***** ***** ***** * * * ***** * * *

 14CSR CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAA AACTTATAATTATAGCTTTT
 670 CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAA AACTTATAATTATAGCTTTT
 6BF CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAA AACTTATAATTATAGCTTTT
 6BSP CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAA AACTTATAATTATAGCTTTT
 19AH CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAA AACTTATAATTATAGCTTTT
 23FPO CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAA AACTTATAATTATAGCTTTT
 19FTW CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAA AACTTATAATTATAGCTTTT
 9VSP CTCTTTTTTGAATTATGATCAGACGAGTTTTACAACCAATACCAA GATTATAGTTATT
 TIGR4 CTCTTTTTTGAATTATGATCAGACGAGTTTTACAACCAATACCAA GATTATAGTTATT
 23FTW CTCTTTTTTGAATTATGATCAGACGAGTTTTACAACCAATACCAA GATTATAGTTATT
 * *** **** * ***** **** ***** * * * * * * ***** * * *

 14CSR TAAATCTCACATCAGATCCTACTGATATTCAA ACTATTAA GGATAGGATTCCATCAGATG
 670 TAAATCTCACATCAGATCCTACTGATATTCAA ACTATTAA GGATAGGATTCCATCAGATG
 6BF TAAATCTCACATCAGATCCTACTGATATTCAA ACTATTAA GGATAGGATTCCATCAGATG
 6BSP TAAATCTCACATCAGATCCTACTGATATTCAA ACTATTAA GGATAGGATTCCATCAGATG
 19AH TAAATCTCACATCAGATCCTACTGATATTCAA ACTATTAA GGATAGGATTCCATCAGATG
 23FPO TAAATCTCACATCAGATCCTACTGATATTCAA ACTATTAA GGATAGGATTCCATCAGATG
 19FTW TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAA ATAAGGTACCTACCGAGG
 9VSP TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAA ATAAGGTACCTACCGAGG
 TIGR4 TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAA ATAAGGTACCTACCGAGG
 23FTW TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAA ATAAGGTACCTACCGAGG
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Figure 196K

PCT/US05/27239

404/487

14CSR CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
670 CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
6BF CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
6BSP CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
19AH CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
23FPO CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
19FTW CAGAAGATCATGATGGAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG
9VSP CAGAAGACCATGATGGAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG
TIGR4 CAGAAGACCATGATGGAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG
23FTW CAGAAGACCATGATGGAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG
***** * * * *
14CSR CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
670 CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
6BF CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
6BSP CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
19AH CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
23FPO CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
19FTW CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA
9VSP CTTTGATGAAGGCCGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA
TIGR4 CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA
23FTW CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA
***** * * * *
14CSR TTTTCCACATTACAGATGGTGTTCGGACTATGTCATATCCAATTAATTTTAAATATACAG
670 TTTTCCACATTACAGATGGTGTTCGGACTATGTCATATCCAATTAATTTTAAATATACAG
6BF TTTTCCACATTACAGATGGTGTTCGGACTATGTCATATCCAATTAATTTTAAATATACAG
6BSP TTTTCCACATTACAGATGGTGTTCGGACTATGTCATATCCAATTAATTTTAAATATACAG
19AH TTTTCCACATTACAGATGGTGTTCGGACTATGTCATATCCAATTAATTTTAAATATACAG
23FPO TTTTCCACATTACAGATGGTGTTCGGACTATGTCATATCCAATTAATTTTAAATATACAG
19FTW TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA
9VSP TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA
TIGR4 TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA
23FTW TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA
***** * * * *
14CSR GAACGACGCAATCGTACAGAAGCTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT
670 GAACGACGCAATCGTACAGAAGCTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT
6BF GAACGACGCAATCGTACAGAAGCTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT
6BSP GAACGACGCAATCGTACAGAAGCTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT
19AH GAACGACGCAATCGTACAGAAGCTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT
23FPO GAACGACGCAATCGTACAGAAGCTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT
19FTW CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTGTAGTAAAT-CTCCTAATAAA
9VSP CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTGTAGTAAAT-CTCCTAATAAA
TIGR4 CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTGTAGTAAAT-CTCCTAATAAA
23FTW CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTGTAGTAAAT-CTCCTAATAAA
* * * * *
14CSR AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
670 AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
6BF AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
6BSP AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
19AH AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
23FPO AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
19FTW GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA
9VSP GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA
TIGR4 GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA
23FTW GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA
* * * * *

Figure 196L

14CSR CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
670 CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
6BF CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
6BSP CAGTGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
19AH CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
23FPO CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
19FTW CGCGGAGATGGGCAAAAGTTACCAGATGTTTACAGATAAGACAGTTTTATGAAAAAGGTGCT
9VSP CGCGGAGATGGGCAAAAGTTACCAGATGTTTACAGATAAGACAGTTTTATGAAAAAGGTGCT
TIGR4 CGCGGAGATGGGCAAAAGTTACCAGATGTTTACAGATAAGACAGTTTTATGAAAAAGGTGCT
23FTW CGCGGAGATGGGCAAAAGTTACCAGATGTTTACAGATAAGACAGTTTTATGAAAAAGGTGCT
** * ** * ** * ** * ** * ** *

14CSR TACGGAGTTCATCAAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
670 TACGGAGTTCATCAAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
6BF TACGGAGTTCATCAAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
6BSP TACGGAGTTCATCAAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
19AH TACGGAGTTCATCAAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
23FPO TACGGAGTTCATCAAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
19FTW CCTGCGAGCTTTCCCAGTTAAACCTGAAAAATATTCTGAAATGAAGCGGCTGGTTATGCA
9VSP CCTGCGAGCTTTCCCAGTTAAACCTGAAAAATATTCTGAAATGAAGCGGCTGGTTATGCA
TIGR4 CCTGCGAGCTTTCCCAGTTAAACCTGAAAAATATTCTGAAATGAAGCGGCTGGTTATGCA
23FTW CCTGCGAGCTTTCCCAGTTAAACCTGAAAAATATTCTGAAATGAAGCGGCTGGTTATGCA
* * * * * * * * * * * * * * *

14CSR TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTTATATTGGCGTGATAGTATTCTA
670 TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTTATATTGGCGTGATAGTATTCTA
6BF TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTTATATTGGCGTGATAGTATTCTA
6BSP TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTTATATTGGCGTGATAGTATTCTA
19AH TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTTATATTGGCGTGATAGTATTCTA
23FPO TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTTATATTGGCGTGATAGTATTCTA
19FTW GTTATAGGCGATCCAATTAATGGTGGATATATTGGCTTAATTGGAGAGAGAGTATTCTG
9VSP GTTATAGGCGATCCAATTAATGGTGGATATATTGGCTTAATTGGAGAGAGAGTATTCTG
TIGR4 GTTATAGGCGATCCAATTAATGGTGGATATATTGGCTTAATTGGAGAGAGAGTATTCTG
23FTW GTTATAGGCGATCCAATTAATGGTGGATATATTGGCTTAATTGGAGAGAGAGTATTCTG
* * * * * * * * * * * * * * *

14CSR GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
670 GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
6BF GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
6BSP GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
19AH GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
23FPO GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
19FTW GCTTATCCGTTTAACTCTAATACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG
9VSP GCTTATCCGTTTAACTCTAATACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG
TIGR4 GCTTATCCGTTTAACTCTAATACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG
23FTW GCTTATCCGTTTAACTCTAATACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG
** * ** * ** * ** * * * * * * * * *

14CSR TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
670 TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
6BF TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
6BSP TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
19AH TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
23FPO TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
19FTW TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTACGGTAGGTATTGGTATT
9VSP TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTACGGTAGGTATTGGTATT
TIGR4 TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTACGGTAGGTATTGGTATT
23FTW TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTACGGTAGGTATTGGTATT
* * * * * * * * * * * * * * *

Figure 196M

[illegible]

Figure 196N

14CSR AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
670 AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
6BF AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
6BSP AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
19AH AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
23FPO AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
19FTW AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
9VSP AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
TIGR4 AATGATGGTGGTTTGTAAAAAATGCAAAAGTGCTCTATGATACGACTGAGAAAAGGATT
23FTW AATGATGGTGGTTTGTAAAAAATGCAAAAGTGCTCTATGATACGACTGAGAAAAGGATT

14CSR CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
670 CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
6BF CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
6BSP CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
19AH CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
23FPO CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
19FTW CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
9VSP CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
TIGR4 CGTGTAACAGGTTCTGTACCTTGAACGGGTGAAAAAGTTACGTTGACCTACAATGTTTCGT
23FTW CGTGTAACAGGTTCTGTACCTTGAACGGGTGAAAAAGTTACGTTGACCTACAATGTTTCGT

14CSR TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC
670 TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC
6BF TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC
6BSP TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC
19AH TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC
23FPO TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC
19FTW TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC
9VSP TTGAATGACCAATTTGTAAGCAATAAATTCTATGACACGAATGGTCGAACAACCCCTACAC
TIGR4 TTGAATGATGAGTTTGTAGCAATAAATTTTATGATACCAATGGTCGAACAACCTTACAT
23FTW TTGAATGATGAGTTTGTAGCAATAAATTTTATGATACCAATGGTCGAACAACCTTACAT

14CSR CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA
670 CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA
6BF CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA
6BSP CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA
19AH CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA
23FPO CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA
19FTW CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA
9VSP CCTAAGGAAGTAGAAAAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA
TIGR4 CCTAAGGAAGTAGAACAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA
23FTW CCTAAGGAAGTAGAACAGAACACAGTGC GCGACTTCCCGATTCCCTAAGATTTCGTGATGTA

14CSR CGAAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
670 CGAAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
6BF CGAAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
6BSP CGAAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
19AH CGAAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
23FPO CGAAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
19FTW CGAAATATCCAGCAATTACGATTGCAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
9VSP CGAAATATCCAGCAATTACGATTGCAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
TIGR4 CGGAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGACATTGAGTTTATT
23FTW CGGAAGTATCCAGAAATCACAATTC AAAAGAGAAAAAACTTGGTGACATTGAGTTTATT

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14CSR AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
670 AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
6BF AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
6BSP AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
19AH AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
23FPO AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
19FTW AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
9VSP AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
TIGR4 AAGGTCAATAAAAAATGATAAAAAACCACTGAGAGGTGCGGTCTTTAGTCTTCAAAAACAA
23FTW AAGGTCAATAAAAAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
*** **

14CSR CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
670 CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
6BF CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
6BSP CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
19AH CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
23FPO CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
19FTW CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
9VSP CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
TIGR4 CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
23FTW CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG

14CSR AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA
670 AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA
6BF AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA
6BSP AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA
19AH AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA
23FPO AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA
19FTW AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA
9VSP AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA
TIGR4 AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA
23FTW AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTGATGGGAAATATCGATTA

14CSR TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
670 TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
6BF TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
6BSP TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
19AH TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
23FPO TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
19FTW TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
9VSP TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
TIGR4 TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
23FTW TTTGAAAATTCTGAACCACTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC

14CSR CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
670 CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
6BF CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
6BSP CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
19AH CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
23FPO CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
19FTW CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
9VSP CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
TIGR4 CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG
23FTW CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATACCAGCG

Figure 196P

PCT/US05/27239/409/487

14CSR GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
670 GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
6BF GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
6BSP GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
19AH GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
23FPO GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
19FTW GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
9VSP GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
TIGR4 GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
23FTW GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
***** ** ***** ** ***** **

14CSR GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
670 GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
6BF GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
6BSP GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
19AH GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
23FPO GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
19FTW GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
9VSP GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
TIGR4 GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
23FTW GAATATCCTCGAAGTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
***** *****

14CSR ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT
670 ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT
6BF ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT
6BSP ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT
19AH ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT
23FPO ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT
19FTW ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT
9VSP ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT
TIGR4 ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT
23FTW ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT
***** *****

14CSR AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
670 AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
6BF AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
6BSP AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
19AH AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
23FPO AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
19FTW AATATCTATGTTCTGAACAATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
9VSP AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
TIGR4 AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
23FTW AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
***** ** ***** * *****

14CSR CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
670 CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
6BF CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
6BSP CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
19AH CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
23FPO CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
19FTW CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
9VSP CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
TIGR4 CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
23FTW CTTGGTGAAAACAGTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
***** * ***** * *****

Figure 196Q

410/487

14CSR AAACCTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
670 AAACCTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
6BF AAACCTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
6BSP AAACCTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
19AH AAACCTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
23FPO AAACCTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
19FTW AAACCTGCACAGAAAAA--GGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
9VSP AAACCTGCACAGAAAAA--GGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
TIGR4 AAACCTGCACAGAAAAA--GGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
23FTW AAACCTGCACAGAAAAA--GGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT

14CSR TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
670 TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
6BF TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
6BSP TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
19AH TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
23FPO TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
19FTW TGATTTTAAGAGATA--AATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
9VSP TGATTTTAAGAGATA--AATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
TIGR4 TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
23FTW TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT

14CSR GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTTCAGCTGCAACAGTTTTTGC GGC
670 GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTTCAGCTGCAACAGTTTTTGC GGC
6BF GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTTCAGCTGCAACAGTTTTTGC GGC
6BSP GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTTCAGCTGCAACAGTTTTTGC GGC
19AH GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTTCAGCTGCAACAGTTTTTGC GGC
23FPO GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTTCAGCTGCAACAGTTTTTGC GGC
19FTW GCTTGCTGCCTTATTATTGACAGCGAGTAGCCTGTTTTTCAGCTGCAACAGTTTTTGC GGC
9VSP GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTTCAGCTGCAACAGTTTTTGC GGC
TIGR4 GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTTCAGCTGCAACAGTTTTTGC GGC
23FTW ACTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTCTCAGCTGCAACAGTTTTTGC GGC

14CSR GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTAAACAATCCATAAGTTACT
670 GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTAAACAATCCATAAGTTACT
6BF GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTAAACAATCCATAAGTTACT
6BSP GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTAAACAATCCATAAGTTACT
19AH GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTAAACAATCCATAAGTTACT
23FPO GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTAAACAATCCATAAGTTACT
19FTW TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT
9VSP TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT
TIGR4 TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT
23FTW GGA-ACAAAAA--ACTAAGCACTTACAGTTCATAAATATTGATGACAGATCAAGAGCT
* * * * *

14CSR GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA--AGGATATGATG
670 GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA--AGGATATGATG
6BF GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA--AGGATATGATG
6BSP GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA--AGGATATGATG
19AH GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA--AGGATATGATG
23FPO GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA--AGGATATGATG
19FTW GGATAAAATTGCAATGAGTTAGAAACAGGTAACCTATGCTGGTAATAA--AGTGGGTGTTT
9VSP GGATAAAATTGCAATGAGTTAGAAACAGGTAACCTATGCTGGTAATAA--AGTGGGTGTTT
TIGR4 GGATAAAATTGCAATGAGTTAGAAACAGGTAACCTATGCTGGTAATAA--AGTGGGTGTTT
23FTW TGAC-----GCTTGAATTCTGATGCGATTACTACTGCAGGTTATGACGGTTCGCAAAA
* * * * *

Figure 196R

14CSR GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
670 GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
6BF GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
6BSP GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
19AH GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
23FPO GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
19FTW TACCTGCA---AATGCAAAAGAAATTGCCGGTGTATGTTTCGTTTGGACAAATACTAATA
9VSP TACCTGCA---AATGCAAAAGAAATTGCCGGTGTATGTTTCGTTTGGACAAATACTAATA
TIGR4 TACCTGCA---AATGCAAAAGAAATTGCCGGTGTATGTTTCGTTTGGACAAATACTAATA
23FTW T-TTGAA---CAGTTCAAACAACCTCAAGGTGTTCCACAAG---GAGTAACCGAAATCT
* * * * * * * * *

14CSR GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
670 GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
6BF GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
6BSP GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
19AH GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
23FPO GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
19FTW ATGAAATTATTGATGAAAATGGCCAACTCTAGGAGTGAATATTGATCCACAAACATTTA
9VSP ATGAAATTATTGATGAAAATGGCCAACTCTAGGAGTGAATATTGATCCACAAACATTTA
TIGR4 ATGAAATTATTGATGAAAATGGCCAACTCTAGGAGTGAATATTGATCCACAAACATTTA
23FTW CTGGTGTTCG--ATTTCGAGTTACAGAGTTATACGGGTCTCAAGGA--AAAGAAACAAGAA
* ** * * * * * *

14CSR AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACATAAGATGG
670 AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACATAAGATGG
6BF AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACATAAGATGG
6BSP AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACATAAGATGG
19AH AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACATAAGATGG
23FPO AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACATAAGATGG
19FTW AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG
9VSP AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG
TIGR4 AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG
23FTW AA-TTTAACGAATGATGATCGGTTTGAGACTGCGGTTAATAAAGGTGTGACGACTGAAACGAGG
* * * * * * * * *

14CSR ACTTAAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
670 ACTTAAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
6BF ACTTAAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
6BSP ACTTAAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
19AH ACTTAAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
23FPO ACTTAAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
19FTW AGCTAAATTTAACACGGCAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG
9VSP AGCTAAATTTAACACGGCAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG
TIGR4 AGCTAAATTTAACACGGCAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG
23FTW TGTAAATTTGATACTGAAGTTTACAAGGGAC---ATATCGTCTGTGCAAGTACGTAA
* * * * * * * * *

14CSR AAAGACTACCTATGTTGGTCCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
670 AAAGACTACCTATGTTGGTCCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
6BF AAAGACTACCTATGTTGGTCCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
6BSP AAAGACTACCTATGTTGGTCCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
19AH AAAGACTACCTATGTTGGTCCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
23FPO AAAGACTACCTATGTTGGTCCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
19FTW TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT
9VSP TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT
TIGR4 TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT
23FTW AGAATCGACTTATGTCGGTCCAAATGGTAAAGTTTTAACAGGTATGAAAGCTGTTCTCTGC
* * * * * * * * *

Figure 196S

PCT/US05/27239 412/487

14CSR TCTTGTAACCTCTTCCACTTGTTAAACAATAATGGTACAGTAATTGATGCACATGTTTTCCC
670 TCTTGTAACCTCTTCCACTTGTTAAACAATAATGGTACAGTAATTGATGCACATGTTTTCCC
6BF TCTTGTAACCTCTTCCACTTGTTAAACAATAATGGTACAGTAATTGATGCACATGTTTTCCC
6BSP TCTTGTAACCTCTTCCACTTGTTAAACAATAATGGTACAGTAATTGATGCACATGTTTTCCC
19AH TCTTGTAACCTCTTCCACTTGTTAAACAATAATGGTACAGTAATTGATGCACATGTTTTCCC
23FPO TCTTGTAACCTCTTCCACTTGTTAAACAATAATGGTACAGTAATTGATGCACATGTTTTCCC
19FTW TGAAATTGAATTACCATT-----GAACGATGTTGTGGA---TGCGCATGTGTATCC
9VSP TGAAATTGAATTACCATT-----GAACGATGTTGTGGA---TGCGCATGTGTATCC
TIGR4 TGAAATTGAATTACCATT-----GAACGATGTTGTGGA---TGCGCATGTGTATCC
23FTW TTTAATTACTCTGCCGCTTGTAACCAAATGGTGTGTAGAAAATGCACATGCTATCC
* * * * * * * * * * * * * * * * * *

14CSR TAAAAATTCATATAATAAACCAGTTGTAGATAAAAGAATTGCTGATACTTTGAATTATAA
670 TAAAAATTCATATAATAAACCAGTTGTAGATAAAAGAATTGCTGATACTTTGAATTATAA
6BF TAAAAATTCATATAATAAACCAGTTGTAGATAAAAGAATTGCTGATACTTTGAATTATAA
6BSP TAAAAATTCATATAATAAACCAGTTGTAGATAAAAGAATTGCTGATACTTTGAATTATAA
19AH TAAAAATTCATATAATAAACCAGTTGTAGATAAAAGAATTGCTGATACTTTGAATTATAA
23FPO TAAAAATTCATATAATAAACCAGTTGTAGATAAAAGAATTGCTGATACTTTGAATTATAA
19FTW AAAAAATACAGAAGCAAAGCCAAAAATTGATAAAGATTTCAAAGGTAAAGCAAATCCAGA
9VSP AAAAAATACAGAAGCAAAGCCAAAAATTGATAAAGATTTCAAAGGTAAAGCAAATCCAGA
TIGR4 AAAAAATACAGAAGCAAAGCCAAAAATTGATAAAGATTTCAAAGGTAAAGCAAATCCAGA
23FTW AAGAATTCTGAAGACAACCTACAGCAACGAAACATTTGATACTGCAGCAGGTTTCGT
* * * * * * * * * * * * * * * * * *

14CSR CGATCAA-----AATGGTCTGTCTATCGGTACTAAAATCCCATATGTTGT----TA
670 CGATCAA-----AATGGTCTGTCTATCGGTACTAAAATCCCATATGTTGT----TA
6BF CGATCAA-----AATGGTCTGTCTATCGGTACTAAAATCCCATATGTTGT----TA
6BSP CGATCAA-----AATGGTCTGTCTATCGGTACTAAAATCCCATATGTTGT----TA
19AH CGATCAA-----AATGGTCTGTCTATCGGTACTAAAATCCCATATGTTGT----TA
23FPO CGATCAA-----AATGGTCTGTCTATCGGTACTAAAATCCCATATGTTGT----TA
19FTW TACACCACGTGTAGATAAAGATACACCTGTGAACCACCAAGTTGGAGATGTTGTAGAGTA
9VSP TACACCACGTGTAGATAAAGATACACCTGTGAACCACCAAGTTGGAGATGTTGTAGAGTA
TIGR4 TACACCACGTGTAGATAAAGATACACCTGTGAACCACCAAGTTGGAGATGTTGTAGAGTA
23FTW AGATCCAGGTG---AAAAAGGTTTAGCAATTGGCACTAAGGTACCGTATATTGT----TA
* * * * * * * * * * * * * * * * * *

14CSR ATACAACAATTCCAAGTAATGCAACATT-----TGCAACTTCATTTTGGTCAGATG
670 ATACAACAATTCCAAGTAATGCAACATT-----TGCAACTTCATTTTGGTCAGATG
6BF ATACAACAATTCCAAGTAATGCAACATT-----TGCAACTTCATTTTGGTCAGATG
6BSP ATACAACAATTCCAAGTAATGCAACATT-----TGCAACTTCATTTTGGTCAGATG
19AH ATACAACAATTCCAAGTAATGCAACATT-----TGCAACTTCATTTTGGTCAGATG
23FPO ATACAACAATTCCAAGTAATGCAACATT-----TGCAACTTCATTTTGGTCAGATG
19FTW CGA-AATTGTTACAAAAATCCAGCACTTGCTAATTATGCAACAGCAAACCTGGAGCGATA
9VSP CGA-AATTGTTACAAAAATCCAGCACTTGCTAATTATGCAACAGCAAACCTGGAGCGATA
TIGR4 CGA-AATTGTTACAAAAATCCAGCACTTGCTAATTATGCAACAGCAAACCTGGAGCGATA
23FTW CAACAACATATCCGAAAAACTCAACTCT-----TGCAACAGCTTTCTGGTCAGATG
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14CSR AAATGACAGAAGGTCTAACTTATAATGAAGA-GTAACAA---TTACTTTGAATAATGTAG
670 AAATGACAGAAGGTCTAACTTATAATGAAGATGTAACAA---TTACTTTGAATAATGTAG
6BF AAATGACAGAAGGTCTAACTTATAATGAAGATGTAACAA---TTACTTTGAATAATGTAG
6BSP AAATGACAGAAGGTCTAACTTATAATGAAGATGTAACAA---TTACTTTGAATAATGTAG
19AH AAATGACAGAAGGTCTAACTTATAATGAAGATGTAACAA---TTACTTTGAATAATGTAG
23FPO AAATGACAGAAGGTCTAACTTATAATGAAGATGTAACAA---TTACTTTGAATAATGTAG
19FTW GAATGACTGAAGGTTTGGCATTCAACAAAGGTACAGTGAAAGTAACTGTTGATGATGTTG
9VSP GAATGACTGAAGGTTTGGCATTCAACAAAGGTACAGTGAAAGTAACTGTTGATGATGTTG
TIGR4 GAATGACTGAAGGTTTGGCATTCAACAAAGGTACAGTGAAAGTAACTGTTGATGATGTTG
23FTW AAATGACAGAAGGTCTAGATTATAATGGTGATGATGTT---GTTAATTATAATGGTCAAC
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Figure 196T

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414/487

14CSR CTCCAATCAATC-TGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
670 CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
6BF CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
6BSP CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
19AH CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
23FPO CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
19FTW AACCACCTTGATCCAACAGAGCCAAAAGTTGTTACATATGGTAAAAAGTTTGTCAAAGTTA
9VSP AACCACCTTGATCCAACAGAGCCAAAAGTTGTTACATATGGTAAAAAGTTTGTCAAAGTTA
TIGR4 AACCACCTTGATCCAACAGAGCCAAAAGTTGTTACATATGGTAAAAAGTTTGTCAAAGTTA
23FTW AACCACATAATCCTGAAGAGCCACGTGTAAAAACATATGGTAAAAAGTTTGTCAAAGTTG
*** * *** **

Figure 196V

PCT/US05/27239

14CSR ACCAAAAAGATACTCGTCTAGAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---A
670 ACCAAAAAGATACTCGTCTAGAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---A
6BF ACCAAAAAGATACTCGTCTAGAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---A
6BSP ACCAAAAAGATACTCGTCTAGAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---A
19AH ACCAAAAAGATACTCGTCTAGAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---A
23FPO ACCAAAAAGATACTCGTCTAGAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---A
19FTW ATGATAAAGATAATCGTTAGCTGGGGCAGAATTTGTAATTGCAAATGCTGATAATGCTG
9VSP ATGATAAAGATAATCGTTAGCTGGGGCAGAATTTGTAATTGCAAATGCTGATAATGCTG
TIGR4 ATGATAAAGATAATCGTTAGCTGGGGCAGAATTTGTAATTGCAAATGCTGATAATGCTG
23FTW ACCAAAAAGACGAACGCTTAAAGAAGCACAATTGTTGTAAGAATG---AGCAA----G
* * * * *

14CSR ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
670 ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
6BF ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
6BSP ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
19AH ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
23FPO ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
19FTW GTCAATATTTAGCACGTAAAGCAG--ATAAAGTGAGTCAAGAAGAGAAGCAGTTGGTTGT
9VSP GTCAATATTTAGCACGTAAAGCAG--ATAAAGTGAGTCAAGAAGAGAAGCAGTTGGTTGT
TIGR4 GTCAATATTTAGCACGTAAAGCAG--ATAAAGTGAGTCAAGAAGAGAAGCAGTTGGTTGT
23FTW GGAAATATCTTGCACTCAAATCTGCAGCACACAAGCT--GTAAATGAGAAAGCTGCCGC
* * * * *

14CSR AACTGCAAAACAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
670 AACTGCAAAACAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
6BF AACTGCAAAACAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
6BSP AACTGCAAAACAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
19AH AACTGCAAAACAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
23FPO AACTGCAAAACAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
19FTW TACAACAAAGGATGCTTTAGATAGAGCAGTTGCTGCTTATAACGCTCTTACTGCACAACA
9VSP TACAACAAAGGATGCTTTAGATAGAGCAGTTGCTGCTTATAACGCTCTTACTGCACAACA
TIGR4 TACAACAAAGGATGCTTTAGATAGAGCAGTTGCTGCTTATAACGCTCTTACTGCACAACA
23FTW AGAAGCGAAACAAGCGCTAGATGCAGCGATAGCAGCCTATA---CAAATGCTGCA-GATA
* * * * *

14CSR GCAAGCCGCTCAA-----GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
670 GCAAGCCGCTCAA-----GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
6BF GCAAGCCGCTCAA-----GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
6BSP GCAAGCCGCTCAA-----GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
19AH GCAAGCCGCTCAA-----GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
23FPO GCAAGCCGCTCAA-----GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
19FTW ACAAACTCAGCAAGAAAAAGAGAAAGTTGACAAAGCTCAAGCTGCTTATAATGCTGCTGT
9VSP ACAAACTCAGCAAGAAAAAGAGAAAGTTGACAAAGCTCAAGCTGCTTATAATGCTGCTGT
TIGR4 ACAAACTCAGCAAGAAAAAGAGAAAGTTGACAAAGCTCAAGCTGCTTATAATGCTGCTGT
23FTW A-AAATGCAGCAC----AAGCTGATAGATGCTGCGCAAAAACATATAATGCAATTA
* * * * *

14CSR CAAAGAAGCCAA-----ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
670 CAAAGAAGCCAA-----ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
6BF CAAAGAAGCCAA-----ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
6BSP CAAAGAAGCCAA-----ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
19AH CAAAGAAGCCAA-----ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
23FPO CAAAGAAGCCAA-----ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
19FTW GATTGCTGCCAACAAATGCATTTGAATGGGTGGCAGATAAGGACAATGAAAATGTTGTGAA
9VSP GATTGCTGCCAACAAATGCATTTGAATGGGTGGCAGATAAGGACAATGAAAATGTTGTGAA
TIGR4 GATTGCTGCCAACAAATGCATTTGAATGGGTGGCAGATAAGGACAATGAAAATGTTGTGAA
23FTW CAGAGCAGCTAG-----ATTTGGCTATGTAGAAGTAGAGAGAAAAGATGCGTTAGT
* * * * *

Figure 196W

PCT/US2005/027239 416/487

14CSR TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA
670 TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA
6BF TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA
6BSP TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA
19AH TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA
23FPO TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA
19FTW ATTAGTTTCTGATGCACAAGGTCGCTTTGAAATTACAGGCCCTTCTTGAGGTACATATTA
9VSP ATTAGTTTCTGATGCACAAGGTCGCTTTGAAATTACAGGCCCTTCTTGAGGTACATATTA
TIGR4 ATTAGTTTCTGATGCACAAGGTCGCTTTGAAATTACAGGCCCTTCTTGAGGTACATATTA
23FTW TCTTACTTCTAACACTGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGAAGCTACAC
* * * * *

14CSR ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
670 ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
6BF ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
6BSP ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
19AH ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
23FPO ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
19FTW CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAAGTCCGTCAGAAATTTGA
9VSP CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAAGTCCGTCAGAAATTTGA
TIGR4 CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAAGTCCGTCAGAAATTTGA
23FTW GTTGAAGAAACAAAAGCTCCAGAAGGTTTTGCGAAAAT---TGGAGATGTAGAATTTGA
* * * * *

14CSR TGTTGGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
670 TGTTGGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
6BF TGTTGGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
6BSP TGTTGGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
19AH TGTTGGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
23FPO TGTTGGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
19FTW AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG
9VSP AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG
TIGR4 AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG
23FTW GGTTGGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
* * * * *

14CSR AAAGAATGACGCTACAAAAGTAGTCAACAAAAAATCACTATCCCACAAACGGGTGGTAT
670 AAAGAATGACGCTACAAAAGTAGTCAACAAAAAATCACTATCCCACAAACGGGTGGTAT
6BF AAAGAATGACGCTACAAAAGTAGTCAACAAAAAATCACTATCCCACAAACGGGTGGTAT
6BSP AAAGAATGACGCTACAAAAGTAGTCAACAAAAAATCACTATCCCACAAACGGGTGGTAT
19AH AAAGAATGACGCTACAAAAGTAGTCAACAAAAAATCACTATCCCACAAACGGGTGGTAT
23FPO AAAGAATGACGCTACAAAAGTAGTCAACAAAAAATCAGATCCCACAAACGGGTGGTAT
19FTW TAAAGATGACGCTACAAAAGTAGTCAACAAAAAATCAGATCCCACAAACGGGTGGTAT
9VSP TAAAGATGACGCTACAAAAGTAGTCAACAAAAAATCAGATCCCACAAACGGGTGGTAT
TIGR4 TAAAGATGACGCTACAAAAGTAGTCAACAAAAAATCACTATCCCACAAACGGGTGGTAT
23FTW GAAGAACGACGCTACAAAAGTAGTCAACAAAAAATCAGATCCCTCAAACGGGTGGTAT
* * * * *

14CSR TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
670 TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
6BF TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
6BSP TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
19AH TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
23FPO TGGTACAATTATCTTTGCTGTAGCAGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA
19FTW TGGTACAATTATCTTTGCTGTAGCAGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA
9VSP TGGTACAATTATCTTTGCTGTAGCAGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA
TIGR4 TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
23FTW TGGTACAATTATCTTTGCTGTAGCGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA

Figure 196X

PCT/US05/27239 417/487

14CSR TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA
670 TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA
6BF TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA
6BSP TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA
19AH TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA
23FPO TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA
19FTW TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA
9VSP TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA
TIGR4 TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA
23FTW TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAAGGAGCCATTGA

14CSR TGACAATGCAGAAAATGCAGAAAATG-----
670 TGACAATGCAGAAAATGCAGAAAATG-----
6BF TGACAATGCAGAAAATGCAGAAAATG-----
6BSP TGACAATGCAGAAAATGCAGAAAATG-----
19AH TGACAATGCAGAAAATGCAGAAAATG-----
23FPO TGACAATGCAGAAAATGCAGAAAATG-----
19FTW TGACAATGCAGAAAATGCAGAAAATG-----
9VSP TGACAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAA
TIGR4 TGACAATGCAGAAAATGCAGAAAATG-----
23FTW TGACAATGCAGAAAATGCAGAAAATG-----

14CSR --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
670 --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
6BF --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
6BSP --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
19AH --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
23FPO --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
19FTW --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
9VSP TGATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
TIGR4 --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
23FTW --ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG

14CSR CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG
670 CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG
6BF CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG
6BSP CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG
19AH CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG
23FPO CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG
19FTW CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG
9VSP CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG
TIGR4 CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG
23FTW CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACATATCAGGAGGTGG

14CSR TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
670 TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
6BF TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
6BSP TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
19AH TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
23FPO TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
19FTW TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
9VSP TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
TIGR4 TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
23FTW TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT

Figure 196Y

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14CSR      ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCTGTTGGGATGAGAATAAAC
670        ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCTGTTGGGATGAGAATAAAC
6BF        ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCTGTTGGGATGAGAATAAAC
6BSP       ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCTGTTGGGATGAGAATAAAC
19AH       ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCTGTTGGGATGAGAATAAAC
23FPO      ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTCTGTTGGGATGAGAATAAAC
19FTW      ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTCTGTTGGGATGAGAATAAAC
9VSP       ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTCTGTTGGGATGAGAATAAAC
TIGR4      ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTCTGTTGGGATGAGAATAAAC
23FTW      ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTCTGTTGGGATGAGAATAAAC
*****

14CSR      TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
670        TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
6BF        TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
6BSP       TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
19AH       TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
23FPO      TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
19FTW      TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
9VSP       TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
TIGR4      TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
23FTW      TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
*****

14CSR      CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT
670        CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT
6BF        CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT
6BSP       CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT
19AH       CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT
23FPO      CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT
19FTW      CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT
9VSP       CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT
TIGR4      CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT
23FTW      CTCATATTCCAAATGGTCTTTACTATGTTGCTCTATTATCCAGACGGATGCGGTTTCTT
*****

14CSR      ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
670        ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
6BF        ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
6BSP       ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
19AH       ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
23FPO      ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
19FTW      ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
9VSP       ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
TIGR4      ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
23FTW      ATCCAGCTGAATTTCTTTTTGAAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
*****

14CSR      CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
670        CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
6BF        CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
6BSP       CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
19AH       CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
23FPO      CGAAAAAACAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
19FTW      CGAAAAAACAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
9VSP       CGAAAAAACAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
TIGR4      CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
23FTW      CGAAAAAACAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
*****

```

Figure 196X

14CSR ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
670 ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
6BF ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
6BSP ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
19AH ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
23FPO ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
19FTW ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
9VSP ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
TIGR4 ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
23FTW ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG

14CSR AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTTCTGGTCAAGTAGGGAGAACTCTCT
670 AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTTCTGGTCAAGTAGGGAGAACTCTCT
6BF AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTTCTGGTCAAGTAGGGAGAACTCTCT
6BSP AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTTCTGGTCAAGTAGGGAGAACTCTCT
19AH AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTTCTGGTCAAGTAGGGAGAACTCTCT
23FPO AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTTCTGGTCAAGTAGGGAGAACTCTCT
19FTW AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTTCTGGTCAAGTAGGGAGAACTCTCT
9VSP AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTTCTGGTCAAGTAGGGAGAACTCTCT
TIGR4 AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTTCTGGTCAAGTAGGGAGAACTCTCT
23FTW AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCCTTCTGGTCAAGTAGGGAGAACTCTCT

14CSR ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
670 ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
6BF ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
6BSP ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
19AH ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
23FPO ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
19FTW ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
9VSP ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
TIGR4 ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
23FTW ATACTGATAAAAAATGGAGAGATTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA

14CSR AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
670 AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
6BF AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
6BSP AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
19AH AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
23FPO AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG
19FTW AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG
9VSP AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG
TIGR4 AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG
23FTW AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG

14CSR TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
670 TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
6BF TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
6BSP TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
19AH TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
23FPO TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
19FTW TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
9VSP TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
TIGR4 TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
23FTW TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG

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14CSR ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
670 ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
6BF ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
6BSP ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
19AH ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
23FPO ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
19FTW ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
9VSP ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
TIGR4 ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
23FTW ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA

14CSR TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
670 TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
6BF TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
6BSP TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
19AH TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
23FPO TGAAAGAAGAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG
19FTW TGAAAGAAGAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG
9VSP TGAAAGAAGAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG
TIGR4 TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
23FTW TGAAAGAAGAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG

14CSR CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
670 CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
6BF CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
6BSP CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
19AH CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
23FPO CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
19FTW CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
9VSP CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
TIGR4 CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
23FTW CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT

14CSR GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
670 GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
6BF GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
6BSP GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
19AH GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
23FPO GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
19FTW GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
9VSP GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
TIGR4 GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
23FTW GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG

14CSR GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
670 GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
6BF GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
6BSP GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
19AH GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
23FPO GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
19FTW GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
9VSP GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
TIGR4 GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
23FTW GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG

Figure 196AB

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14CSR ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
670 ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
6BF ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
6BSP ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
19AH ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
23FPO ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
19FTW ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
9VSP ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
TIGR4 ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
23FTW ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT

14CSR TTGGTAGTGGTTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA
670 TTGGTAGTGGTTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA
6BF TTGGTAGTGGTTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA
6BSP TTGGTAGTGGTTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA
19AH TTGGTAGTGGTTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA
23FPO TTGGTAGTGGCTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA
19FTW TTGGTAGTGGCTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA
9VSP TTGGTAGTGGCTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA
TIGR4 TTGGTAGTGGCTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA
23FTW TTGGTAGTGGCTATTATCTTACGAAAAAACCAATAACTGATATTCAATGTACATCATTA

14CSR TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
670 TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
6BF TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
6BSP TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
19AH TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
23FPO TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
19FTW TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
9VSP TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
TIGR4 TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
23FTW TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA

14CSR TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
670 TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
6BF TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
6BSP TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
19AH TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
23FPO TCATGGTGATTGTGGCATGAATCATAAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
19FTW TCATGGTGATTGTGGCATGAATCATAAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
9VSP TCATGGTGATTGTGGCATGAATCATAAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
TIGR4 TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
23FTW TCATGGTGATTGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC

14CSR TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
670 TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
6BF TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
6BSP TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
19AH TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
23FPO TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
19FTW TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
9VSP TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
TIGR4 TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
23FTW TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG

Figure 196AC

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14CSR ACAGGACTGGGATTCTGATTATAAATGGATGGTGAATCAGAAAGAAATGAGATTTCTCG
670 ACAGGACTGGGATTCTGATTATAAATGGATGGTGAATCAGAAAGAAATGAGATTTCTCG
6BF ACAGGACTGGGATTCTGATTATAAATGGATGGTGAATCAGAAAGAAATGAGATTTCTCG
6BSP ACAGGACTGGGATTCTGATTATAAATGGATGGTGAATCAGAAAGAAATGAGATTTCTCG
19AH ACAGGACTGGGATTCTGATTATAAATGGATGGTGAATCAGAAAGAAATGAGATTTCTCG
23FPO ACAGGACTGGGATTCTGATTATAAATGGATGGTGAATCAGAAAGAAATGAGATTTCTCG
19FTW ACAGGACTGGGATTCTGATTATAAATGGATGGTGAATCAGAAAGAAATGAGATTTCTCG
9VSP ACAGGACTGGGATTCTGATTATAAATGGATGGTGAATCAGAAAGAAATGAGATTTCTCG
TIGR4 ACAGGACTGGGATTCTGATTATAAATGGATGGTGAATCAGAAAGAAATGAGATTTCTCG
23FTW ACAGGACTGGGATTCTGATTATAAATGGATGGTGAATCAGAAAGAAATGAGATTTCTCG

14CSR TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTGAAGAT
670 TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTGAAGAT
6BF TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTGAAGAT
6BSP TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTGAAGAT
19AH TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTGAAGAT
23FPO TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTGAAGAT
19FTW TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTGAAGAT
9VSP TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTGAAGAT
TIGR4 TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTGAAGAT
23FTW TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTGAAGAT

14CSR AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT
670 AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT
6BF AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT
6BSP AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT
19AH AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT
23FPO AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAGCAAAAACGAAACAATCTCCTATT
19FTW AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAGCAAAAACGAAACAATCTCCTATT
9VSP AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAGCAAAAACGAAACAATCTCCTATT
TIGR4 AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT
23FTW AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT

14CSR AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
670 AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
6BF AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
6BSP AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
19AH AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
23FPO AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
19FTW AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
9VSP AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
TIGR4 AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
23FTW AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA

14CSR TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
670 TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
6BF TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
6BSP TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
19AH TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
23FPO TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
19FTW TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
9VSP TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
TIGR4 TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
23FTW TTATCGAGTGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA

Figure 196AD

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14CSR TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA
670 TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA
6BF TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA
6BSP TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA
19AH TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA
23FPO TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA
19FTW TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA
9VSP TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA
TIGR4 TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA
23FTW TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAAGCCTTCAATGACTCTTTGAATAA

14CSR TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAGGGCGAGCAGAGTATGC
670 TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAGGGCGAGCAGAGTATGC
6BF TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAGGGCGAGCAGAGTATGC
6BSP TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAGGGCGAGCAGAGTATGC
19AH TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAGGGCGAGCAGAGTATGC
23FPO TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAGGGCGAGCAGAGTATGC
19FTW TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAGGGCGAGCAGAGTATGC
9VSP TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAGGGCGAGCAGAGTATGC
TIGR4 TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAGGGCGAGCAGAGTATGC
23FTW TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAGGGCGAGCAGAGTATGC

14CSR ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
670 ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
6BF ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
6BSP ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
19AH ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
23FPO ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
19FTW ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
9VSP ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
TIGR4 ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
23FTW ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
*** ***** *

14CSR TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
670 TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
6BF TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
6BSP TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
19AH TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
23FPO TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
19FTW TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
9VSP TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
TIGR4 TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
23FTW TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA

14CSR GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
670 GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
6BF GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
6BSP GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
19AH GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
23FPO GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
19FTW GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
9VSP GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
TIGR4 GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
23FTW GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG

Figure 196AE

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14CSR TTTGCCAACAGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA
670 TTTGCCAACAGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA
6BF TTTGCCAACAGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA
6BSP TTTGCCAACAGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA
19AH TTTGCCAACAGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA
23FPO TTTGCCAACGGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA
19FTW TTTGCCAACGGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA
9VSP TTTGCCAACGGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA
TIGR4 TTTGCCAACAGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA
23FTW TTTGCCAACAGCTAAGATGTTTACGGATTGACCAAACCTTAAAGTTGGGGATAAGTTTTA

14CSR TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
670 TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
6BF TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
6BSP TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
19AH TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
23FPO TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
19FTW TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
9VSP TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
TIGR4 TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
23FTW TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC

14CSR GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
670 GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
6BF GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
6BSP GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
19AH GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
23FPO GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
19FTW GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
9VSP GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
TIGR4 GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
23FTW GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG

14CSR TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
670 TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
6BF TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
6BSP TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
19AH TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
23FPO TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
19FTW TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
9VSP TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
TIGR4 TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT
23FTW TACGCCATACATGATCAATACCCATCGTCTATTGGTTCGGGGGCATCGGATACCGTACGT

14CSR AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT
670 AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT
6BF AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT
6BSP AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT
19AH AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT
23FPO AGCAGAGGTTGAGGAAGAATTTATTGCGGCAAACAACTCAGTCATCTCTATCGCTACCT
19FTW AGCAGAGGTTGAGGAAGAATTTATTGCGGCAAACAACTCAGTCATCTCTATCGCTACCT
9VSP AGCAGAGGTTGAGGAAGAATTTATTGCGGCAAACAACTCAGTCATCTCTATCGCTACCT
TIGR4 AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT
23FTW AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT

Figure 196AF

14CSR GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
670 GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
6BF GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
6BSP GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
19AH GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
23FPO GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
19FTW GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
9VSP GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
TIGR4 GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
23FTW GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA

14CSR GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
670 GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
6BF GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
6BSP GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
19AH GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
23FPO GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA
19FTW GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA
9VSP GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA
TIGR4 GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
23FTW GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
***** * * * * *

14CSR GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAGGCACAAAAAAGAAGAAACATC
670 GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAGGCACAAAAAAGAAGAAACATC
6BF GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAGGCACAAAAAAGAAGAAACATC
6BSP GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAGGCACAAAAAAGAAGAAACATC
19AH GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAGGCACAAAAAAGAAGAAACATC
23FPO GGTAGAGGATGAGTAAGAGTAGATATTACGGAAGAGAGCGTGAAAAAGAGAAAAATC
19FTW GGTAGAGGATGAGTAAGAGTAGATATTACGGAAGAGAGCGTGAAAAAGAGAAAAATC
9VSP GGTAGAGGATGAGTAAGAGTAGATATTACGGAAGAGAGCGTGAAAAAGAGAAAAATC
TIGR4 GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAGGCACAAAAAAGAAGAAACATC
23FTW GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAGGCACAAAAAAGAAGAAACATC
*** * * * * *

14CSR CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
670 CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
6BF CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
6BSP CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
19AH CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
23FPO CGTTCATTCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
19FTW CGTTCATTCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
9VSP CGTTCATTCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
TIGR4 CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
23FTW CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
* * * * *

14CSR CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT
670 CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT
6BF CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT
6BSP CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT
19AH CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT
23FPO CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT
19FTW CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT
9VSP CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT
TIGR4 CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT
23FTW CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAGAGTTTGATGAGACGGTTT

14CSR CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
670 CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
6BF CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
6BSP CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
19AH CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
23FPO CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
19FTW CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
9VSP CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
TIGR4 CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
23FTW CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA

14CSR CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
670 CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
6BF CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
6BSP CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
19AH CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
23FPO CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
19FTW CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGATCAGGAAAAAGAACAGGGAGTTT
9VSP CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
TIGR4 CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
23FTW CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT

14CSR CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAATTCCTGCGA
670 CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAATTCCTGCGA
6BF CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAATTCCTGCGA
6BSP CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAATTCCTGCGA
19AH CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAATTCCTGCGA
23FPO CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAATTCCTGCGA
19FTW CAGAATATGCTAACATGCTAAAGTTCATGAGCGTATCGGATATGTAGAAATTCCTGCGA
9VSP CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAATTCCTGCGA
TIGR4 CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAATTCCTGCGA
23FTW CAGAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAATTCCTGCGA

14CSR TTGATCAGGAAATTCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
670 TTGATCAGGAAATTCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
6BF TTGATCAGGAAATTCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
6BSP TTGATCAGGAAATTCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
19AH TTGATCAGGAAATTCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
23FPO TTGATCAGGAAATTCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
19FTW TTGAACAGGAAATCCCATGTATGTTGGCACAGTGAAGACATTCCTCAGAAAGGGGCGCAG
9VSP TTGATCAGGAAATTCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
TIGR4 TTGATCAGGAAATTCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
23FTW TTGATCAGGAAATTCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG

14CSR GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
670 GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
6BF GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
6BSP GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
19AH GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
23FPO GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
19FTW GGCTGTTAGAAGGGGCTTCGCTGCCTGTTGGAGGTGAAAATACCCATACAGTGATCACTG
9VSP GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
TIGR4 GGCTGTTAGAAGGGGCTTCGCTGCCTGTTGGAGGTGAAAATACCCATACAGTGATCACTG
23FTW GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
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14CSR CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
670 CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
6BF CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
6BSP CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
19AH CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
23FPO CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
19FTW CTCACAGAGGATTGCCAACGGCAGAACTGTTTCACTCAATTGGATAAGATGAAGAAAGGGG
9VSP CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
TIGR4 CTCACAGAGGATTGCCAACGGCAGAACTGTTTCACTCAATTGGATAAGATGAAAAAAGGGG
23FTW CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG

14CSR ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTGGCCTACCAAGTGGATCAGATTTTGA
670 ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTGGCCTACCAAGTGGATCAGATTTTGA
6BF ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTGGCCTACCAAGTGGATCAGATTTTGA
6BSP ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTGGCCTACCAAGTGGATCAGATTTTGA
19AH ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTGGCCTACCAAGTGGATCAGATTTTGA
23FPO ATATCTTTTATCTTCACGTTTTAGATCAGGTGTGGCCTACCAAGTGGATCAGATAGTGA
19FTW ATATCTTTTATCTTCACGTTTTAGACCAGGTGTGGCCTATCAAGTGGATCAGATAGTGA
9VSP ATATCTTTTATCTTCACGTTTTAGATCAGGTGTGGCCTACCAAGTGGATCAGATAGTGA
TIGR4 ATATCTTTTATCTTCACGTTTTAGATCAGGTGTGGCCTACCAAGTGGATCAGATAGTGA
23FTW ATGTCTTTTATCTTCACGTTTTAGACCAGGTGTGGCCTACCAAGTGGATCAGATTTTGA
**

14CSR CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
670 CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
6BF CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
6BSP CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
19AH CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
23FPO CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
19FTW CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACTT
9VSP CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
TIGR4 CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
23FTW CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT

14CSR TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
670 TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
6BF TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
6BSP TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
19AH TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
23FPO TGTTGACTTGTAACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
19FTW TACTGACTTGTAACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
9VSP TGTTGACTTGTAACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
TIGR4 TGTTGACTTGTAACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
23FTW TGTTGACCTGTACACCGTATATGATTAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
* ****

14CSR TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
670 TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
6BF TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
6BSP TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
19AH TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
23FPO TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
19FTW TTCCATATACAGCGCGATTGCTGAGCGGAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
9VSP TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
TIGR4 TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
23FTW TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT

Figure 196I

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14CSR GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC
670 GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC
6BF GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC
6BSP GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC
19AH GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC
23FPO GGTGTGGTTATTACTAGGAGCGATGGCGGTATCCTTCTCTTGTGTATCGCGTGTATC
19FTW GGTGTGGTTATTACTAGGAGCGATGGCGGTATCCTTCTCTTGTGTATCGCGTGTATC
9VSP GGTGTGGTTATTACTAGGAGCGATGGCGGTATCCTTCTCTTGTGTATCGCGTGTATC
TIGR4 GGTGTGGTTATTACTAGGAGCGATGGCGGTATCCTTCTCTTGTGTATCGCGTGTATC
23FTW GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC

14CSR GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT
670 GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT
6BF GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT
6BSP GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT
19AH GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT
23FPO GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAAGGACT
19FTW GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAAGGACT
9VSP GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAAGGACT
TIGR4 GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAAGGACT
23FTW GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT
** * * * *

14CSR AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT
670 AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT
6BF AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT
6BSP AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT
19AH AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT
23FPO AAATACGAGCCTTATTGGGATACTTGTGATGTTGGTAGCCTGTTTGATTCCTATTTAT
19FTW AAATACGAGCCTTATTGGGATACTTGTGATGTTGGTAGCCTGTTTGATTCCTATTTAT
9VSP AAATACGAGCCTTATTGGGATACTTGTGATGTTGGTAGCCTGTTTGATTCCTATTTAT
TIGR4 AAATACGAGCCTTATTGGGATACTTGTGATGTTGGTAGCCTGTTTGATTCCTATTTAT
23FTW AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT
** * * * *

14CSR TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA
670 TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA
6BF TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA
6BSP TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA
19AH TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA
23FPO TGTTTTGGGCAGATGGTGTTGACAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG
19FTW TGTTTTGGGCAGATGGTGTTGACAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG
9VSP TGTTTTGGGCAGATGGTGTTGACAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG
TIGR4 TGTTTTGGGCAGATGGTGTTGACAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG
23FTW TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA

14CSR GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA
670 GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA
6BF GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA
6BSP GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA
19AH GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA
23FPO AAATCCATGACAACCTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA
19FTW AAATCCATGACAACCTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA
9VSP AAATCCATGACAACCTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA
TIGR4 AAATCCATGACAACCTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA
23FTW GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA

Figure 196AJ

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```
14CSR      CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
670        CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
6BF        CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
6BSP       CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
19AH       CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
23FPO      CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
19FTW      CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
9VSP       CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
TIGR4      CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
23FTW      CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
*****

14CSR      TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
670        TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
6BF        TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
6BSP       TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
19AH       TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
23FPO      TACCAAGTGTCTGACGACCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGAA
19FTW      TACCAAGTGTCTGACGACCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGAA
9VSP       TACCAAGTGTCTGACGACCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGAA
TIGR4      TACCAAGTGTCTGACGACCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGAA
23FTW      TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGAA
*****

14CSR      ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
670        ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
6BF        ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
6BSP       ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
19AH       ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
23FPO      ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
19FTW      ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
9VSP       ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
TIGR4      ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
23FTW      ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
*****

14CSR      GTGGATGGGACGCCTCTTCTGTTGAGGGAAAAGGGATTTCGTTCACTGATTGCTGGGCAC
670        GTGGATGGGACGCCTCTTCTGTTGAGGGAAAAGGGATTTCGTTCACTGATTGCTGGGCAC
6BF        GTGGATGGGACGCCTCTTCTGTTGAGGGAAAAGGGATTTCGTTCACTGATTGCTGGGCAC
6BSP       GTGGATGGGACGCCTCTTCTGTTGAGGGAAAAGGGATTTCGTTCACTGATTGCTGGGCAC
19AH       GTGGATGGGACGCCTCTTCTGTTGAGGGAAAAGGGATTTCGTTCACTGATTGCTGGGCAC
23FPO      GTGGATGGTACACCGCTGCCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC
19FTW      GTGGATGGTACACCGCTGCCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC
9VSP       GTGGATGGTACACCGCTGCCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC
TIGR4      GTGGATGGTACACCGCTGCCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC
23FTW      GTGGATGGGACGCCTCTTCTGTTGAGGGAAAAGGGATTTCGTTCACTGATTGCTGGGCAC
*****

14CSR      CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
670        CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
6BF        CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
6BSP       CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
19AH       CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
23FPO      CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
19FTW      CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
9VSP       CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
TIGR4      CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
23FTW      CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
*****
```

Figure 196AK

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14CSR CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
670 CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
6BF CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
6BSP CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
19AH CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
23FPO CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
19FTW CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
9VSP CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
TIGR4 CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
23FTW CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT

14CSR TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
670 TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
6BF TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
6BSP TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
19AH TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
23FPO TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
19FTW TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
9VSP TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
TIGR4 TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
23FTW TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA

14CSR ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
670 ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
6BF ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
6BSP ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
19AH ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
23FPO ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
19FTW ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
9VSP ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
TIGR4 ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
23FTW ACCTGCGATCCGATTCCCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT

14CSR GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
670 GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
6BF GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
6BSP GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
19AH GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
23FPO GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
19FTW GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
9VSP GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
TIGR4 GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
23FTW GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA

14CSR GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
670 GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
6BF GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
6BSP GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
19AH GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
23FPO GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
19FTW GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
9VSP GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
TIGR4 GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
23FTW GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG

Figure 196AL

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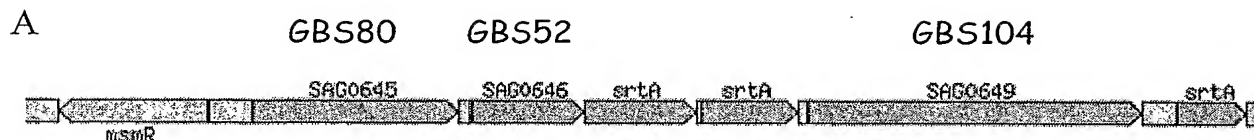
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14CSR      GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
670        GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
6BF        GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
6BSP       GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
19AH       GCATTTATGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
23FPO      GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
19FTW      GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
9VSP       GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
TIGR4      GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
23FTW      GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
*****

14CSR      AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCCTTTTTCCGGCTCTTTGTCAACTGTAGGGG
670        AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCCTTTTTCCGGCTCTTTGTCAACTGTAGTGG
6BF        AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCCTTTTTCCGGCTCTTTGTCAACTGTAG---
6BSP       AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCCTTTTTCCGGCTCTTTGTCAACTGTAG---
19AH       AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCCTTTTTCCGGCTCTTTGTCAACTGTAG---
23FPO      AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCCTTTTTCCGGCTCTTTGTCAACTGT-----
19FTW      AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCCTTTTTCCGGCTCTTTGTCAACTGTAGT--
9VSP       AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCCTTTTTCCGGCTCTTTGTCAACTGTAG---
TIGR4      AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCCTTTTTCCGGCTCTTTGTCAACTGTAGTGG
23FTW      AAAGAAATGAAAGGAAAGCTAAGGCTGTTCCCTTTTTCCGGCTCTTTGTCAACTGTAGT---
*****
```

Figure 196AM

Figure 197



B

Intergenic region between AraC R and GBS 80

AraC...CAT

TTGATAGAC**CCGCCTTC**ATTATCATTTCTAGAATTTTTCTTTAGGTTTGTA
 AAGACTACAAAATAAAATGATGAAAACAACATCTTGTGGATACACTAAA
 AAGACACGCTAATTAGCAAACCTCTCTTCATCATCTCTCACCATTATTA
 TACTAC **TATTTATAT**GACAAATAAAGGT**GATTT** **TGTTAA**AATATAACTTT
 GAAAATCCACATATATTTTTTAATCTTCCGTCTG**AAAAAA**TAAATAAAAAT
 AGTAAAAATAAACACGAATTTAAAATAAGCAAATTTTTTAAGAAAATCTG
 TGCTAAACTTTAATAGTTTTGTGCTTAATAATAATCAGCACTTACAAAGA
 ACAAAGGGAAAAGCGAG**GAGAGA**ACTTTTA **ATG.. GBS80**

C

187	4A		5A		5A
233	6A		6A		7A
Strain	FACS α -80	Strain	FACS α -80	Strain	FACS α -80
1998	95	5364	454	2129	57
2110	0	JMV071	556	2274	113
2603	62	JM91003	587	5401	170
3050	43	CJB111	365	5408	0
5376	165			5518	31
M781	65			CJB110	71
COH1	305 (G→T 179)			J7357B	91
18rs 21	0 (STOP, no LPXTG)			COH31	0

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AI-1											
			aa	M1	M3	M5	M18	M49	M6	M12	
M6											
50913503	M6_Spy0157	LPXTG	628	gas15 30%in593aa	M3-0098 46%in256aa M3-0104 28%in563aa		M18-0132 24%in701aa			M12-4134 74%in703aa	Fibronecti n-binding protein (protein F)
50913505	M6_Spy0159	LPXSG	1037		M3-0104 25%in339aa					M12-4141 37%in98aa	Collagen adhesion protein
50913506	M6_Spy0160	LPXTG	557								Fimbrial structural subunit

Figure 198

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AI-2									
		aa	M1	M3	M5	M18	M49	M6	M12
M1									
gas15	gas15	VXGTG	762	M3-0098 50%in738aa	M5-orf78 60%in462aa	M18-0126 54%in469aa			M12-4135 54%in747aa
13621428	SPy0128 gas16	EVXTG	340	M3-0100 40%in354aa	M5-orf80 41%in358aa	M18-0128 38%in357aa			M12-4137 40%in354aa
13621430	SPy0130 gas18	LPXTG	215	M3-0102 32%200aa	M5-orf82 31%in213aa	M18-0130 32%in213aa			M12-4139 31%in206aa
									hypothetical al protein (fimbria)
									hypothetical al protein

Figure 199

AI-3										
			aa	M1	M3	M5	M18	M49	M6	M12
M3										
21909634	SpyM3_0098	VPXTG	744	gas15 51%in739aa		M5-orf78 58%in484aa	M18-0126 74%in482aa			M12-4135 55%in751aa
21909636	SpyM3_0100	QVXTG	344	gas16 40%in354aa		M5-orf80 64%in349aa	M18-0128 67%in345aa			M12-4137 61%in344aa
21909638	SpyM3_0102	LPXAG	195	gas18 32%in200aa		M5-orf82 98%in183aa	M18-0130 97%in183aa			M12-4139 99%in183aa
21909640	SpyM3_0104	LPXTG	696			M5-orf84 88%in656aa	M18-0132 88%in656aa			M12-4141 59%in612aa
										putative collagen binding protein (Cpb)
										conserved hypothetical al protein (fimbrial)
										hypothetical al protein
										protein F2 like fibronectin-binding

Figure 200A

Figure 200B

Figure 200B

Figure 200C

Figure 200C

M49												
56808848	VPXTG	744	gas15 55%in738aa	M3-0098 72%in743aa	M5-orf78 78%in483	M18-0126 61% in484				M12-4135 73%in752aa	putative collagen binding protein (Cpb)	
56808846	QVXTG	344	gas16 36%in355aa	M3-0100 66%in345aa	M5-orf80 61%in349aa	M18-0128 90%in344aa				M12-4137 62%in344aa	conserved hypothetic al protein (fimbrial)	
56808844	LPXAG	189	gas18 31%in206aa	M3-102 98%in189aa	M5-orf82 98%in189aa	M18-0130 98%in189aa				M12-4139 98%in189aa	hypothetic al protein	
56808842	LPXTG	1160		M3-104 59%in612aa	M5-orf84 50%in701aa	M18-0132 50%in701aa			M6-0157 32%in296aa	M12-4141 91%in1164aa	protein F2 like fibronectin -binding	

Figure 200D

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AI-4										
		aa	M1	M3	M5	M18	M49	M6	M12	
M12										
19224134	LPXTG	698	gas15 44%in297aa	M3-0098 49%in254aa				M6-0157 74%in703aa		protein F
19224135	VPXTG	756	gas15 54%in747aa	M3-0098 55%in751aa	orf78 80%in484aa	M18-0126 59%in483aa		M6-0157 51%in275aa		Cpa
19224137	QVXTG	342	gas16 40%in354aa	M3-0100 61%in344aa	orf80 65%in384aa	M18-0128 62%in344aa				EflSLA (fimbrial)
19224139	LPXAG	189	gas18 31%in206aa	M3-0102 99%in183aa	orf82 98%in189aa	M18-130 97%in189aa				Orf2
19224141	LPXTG	1161		M3-0104 59%in612aa	orf84 50%in701aa	M18-0132 50%in701aa				protein F2

Figure 201

Figure 202

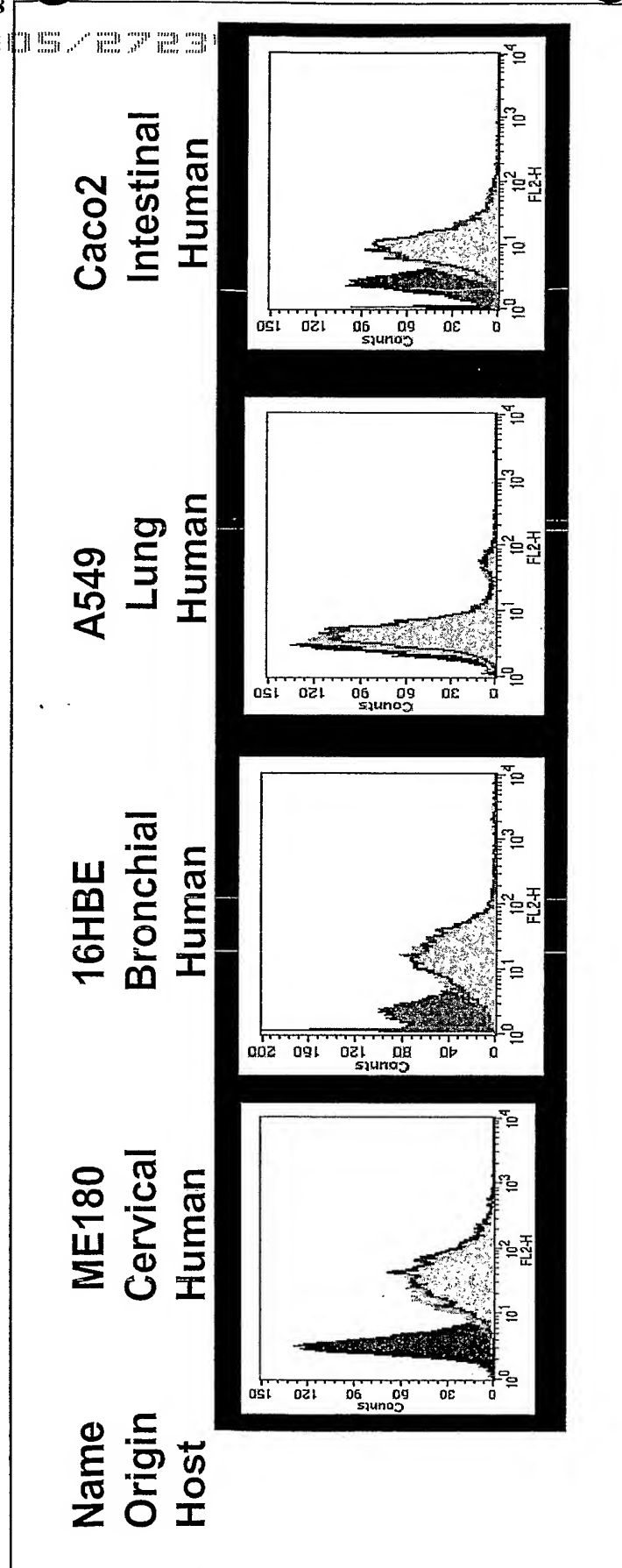
WO 2006/078318

PCT/US2005/027239

440/487

PCT/US2005/027239

GBS80 recombinant protein does not bind to epithelial cells

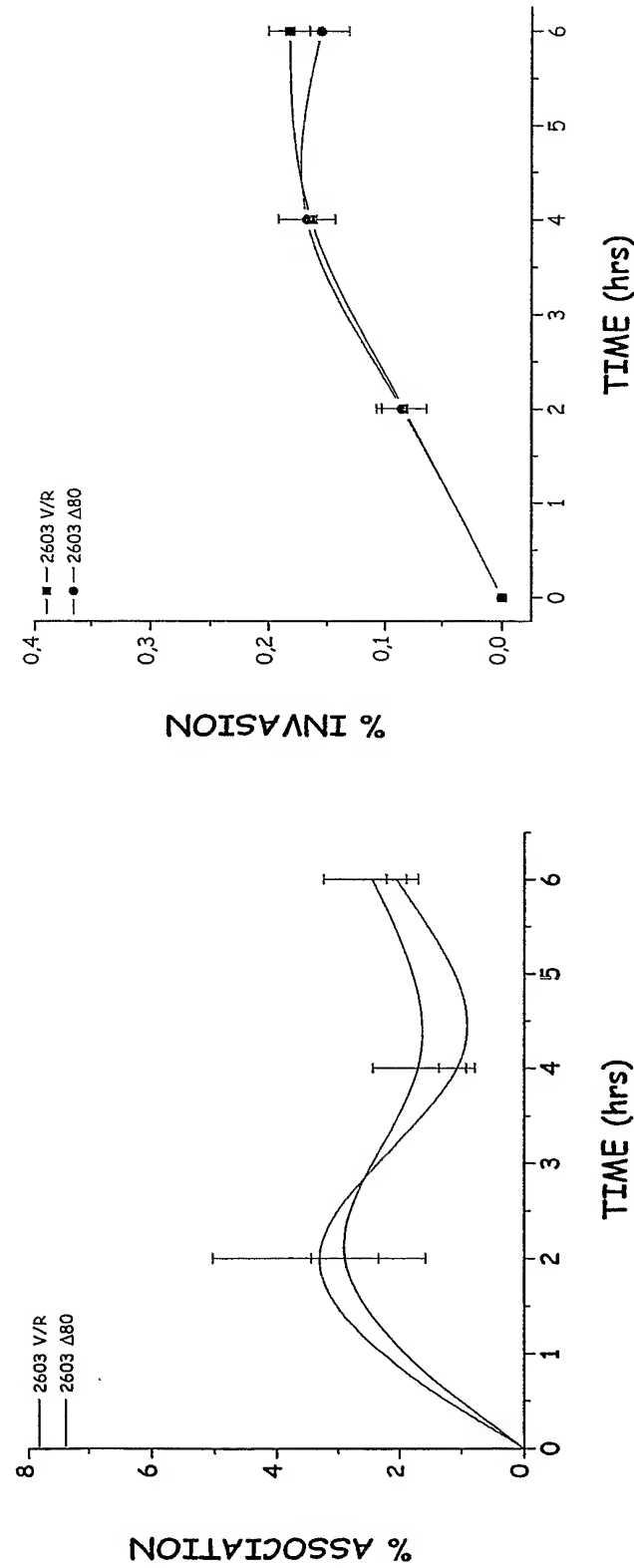


Epithelial cells were incubated in the presence or absence of GBS80 protein and then a mouse a-GBS80 polyclonal antibody added. The cell were then stained with FITC-conjugated a-mouse IgG antibody. The violet area indicates cells treated with FITC-conjugated antibody alone. GBS80 binding, expressed as Dmean channel values, was measured by FACScan cytometer as difference in fluorescence intensity between cell incubated with or without GBS80. The same protocol was used for GBS101 protein binding to epithelial cells

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Figure 203

Deletion of GBS80 protein does not affect the ability of GBS to adhere and invade ME180



ME180 cervical carcinoma epithelial cells were infected with GBS 2603 wild type or 2603 D80 isogenic mutant. After 2h infection, non-adherent bacteria were washed off and infection prolonged for further 2h and 4h. In invasion experiments, after each time point followed a 2h antibiotic treatment. Cells were then lysed with 1% saponin and lysates plated on TSA plates.

Figure 204

GBS80 binds to ECM proteins

ELISA with purified ECM components and native GBS80 protein

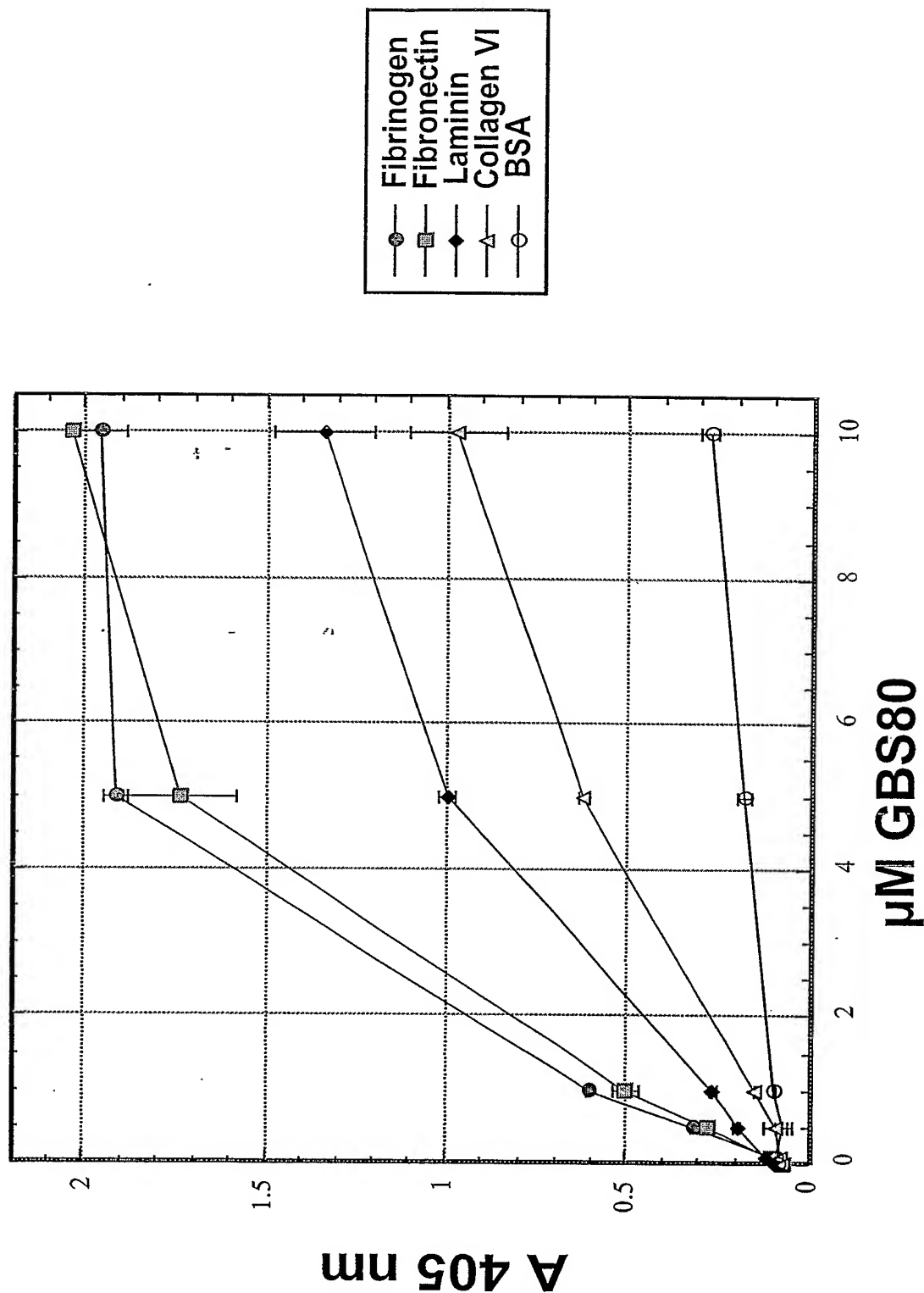
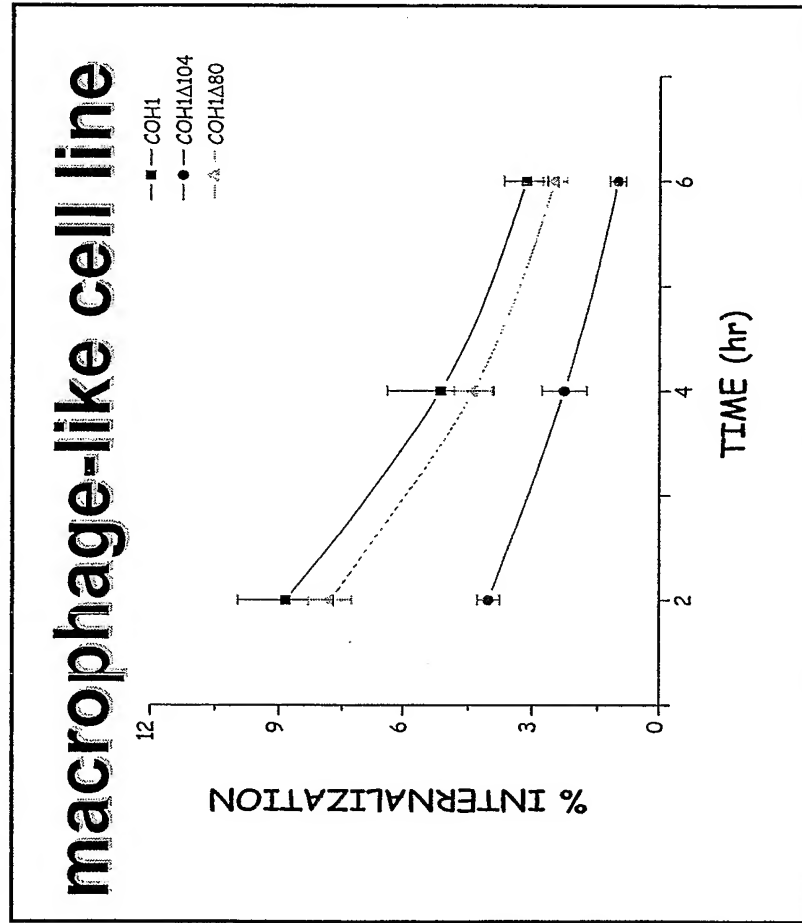


Figure 205

Deletion of GBS104 protein, but not GBS80, reduces the capacity of GBS to invade J774



J774 cells were infected with GBS COH1 wild type or COH1ΔGBS104/COH1ΔGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and intracellular bacteria recovered at 2h, 4h and 6h post-antibiotic treatment. At each time point cells were lysed with 0.25% Triton X-100 and

Figure 206

**GBS104 knockout mutant strain translocates
through an epithelial monolayer less efficiently than
the isogenic wild type**

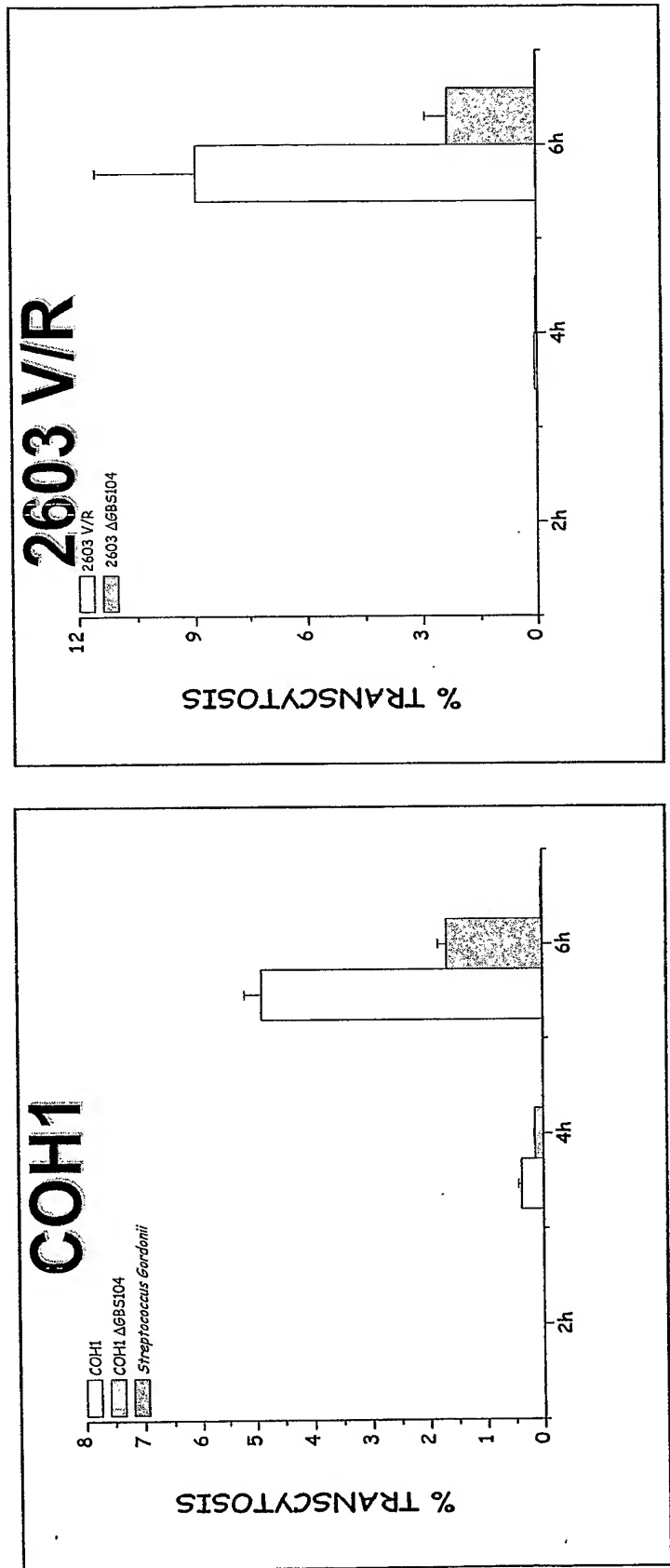
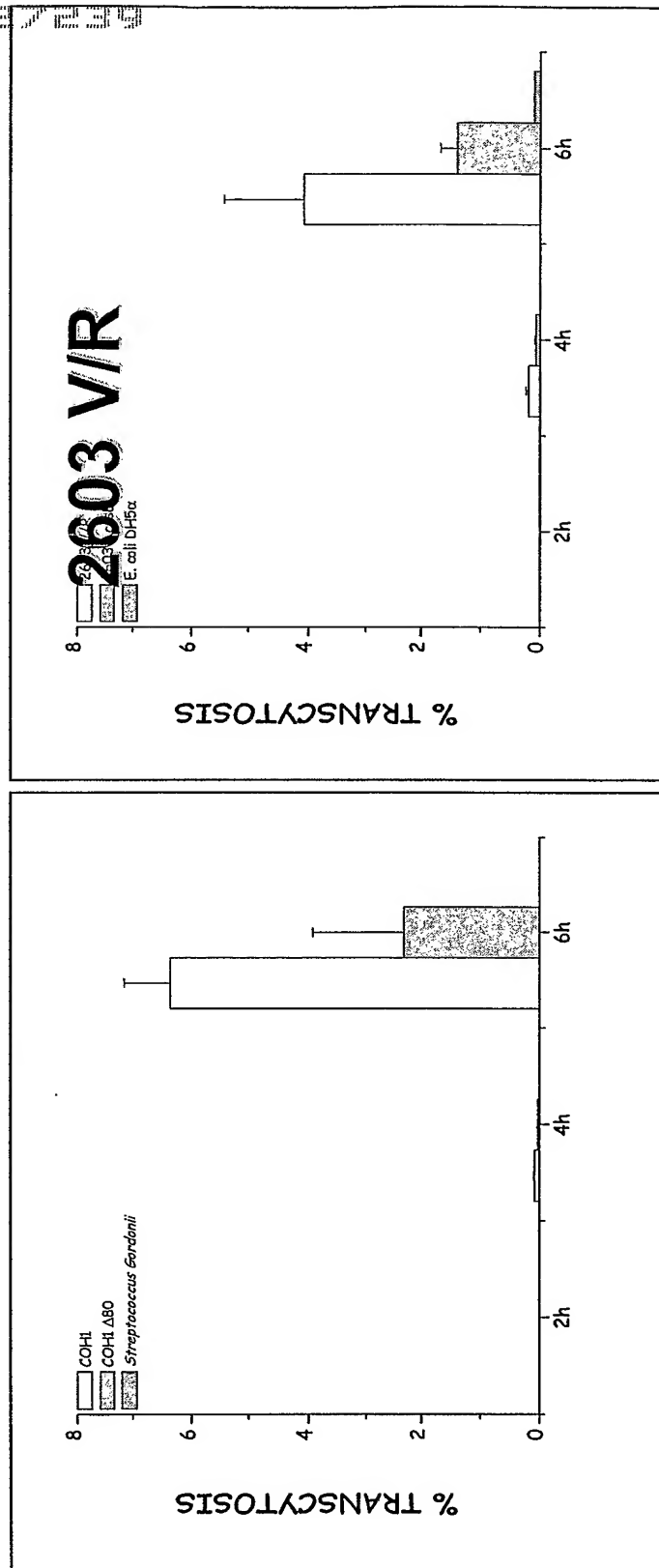


Figure 207

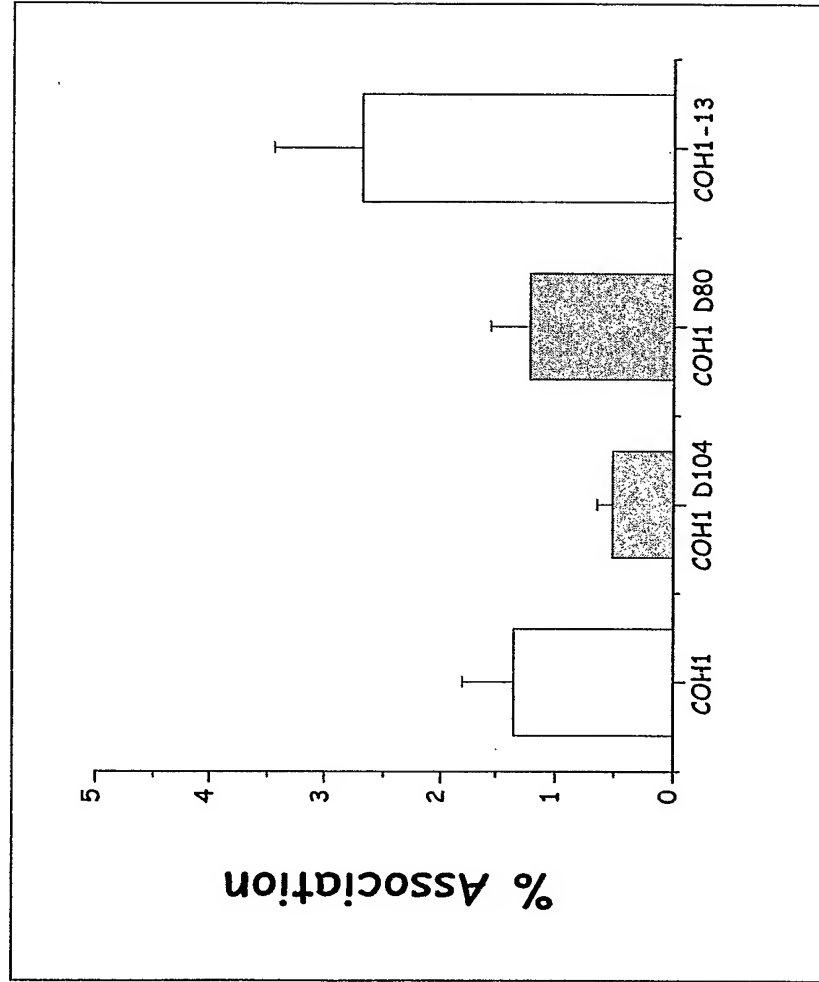
GBS80 knockout mutant strain partially loses the ability to translocate through an epithelial monolayer



Epithelial cells monolayers were inoculated with each bacterium in the apical chamber of a transwell system for 2h and then non-adherent bacteria washed off. Infection was prolonged for further 2h and 4h. Samples were taken from the media of the basolateral side and the number of colony forming units measured. Transepithelial electrical resistance measured prior and after infection gave comparable values, indicating the maintenance of the integrity of the monolayer.

Figure 208

GBS adherence to HUVEC endothelial cells



HUVEC cells were infected with GBS COH1 wild type or COH1DGBS104/COH1DGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and cells lysed with 1% saponin and lysates plated on TSA plates.

COH1 strain growth rate

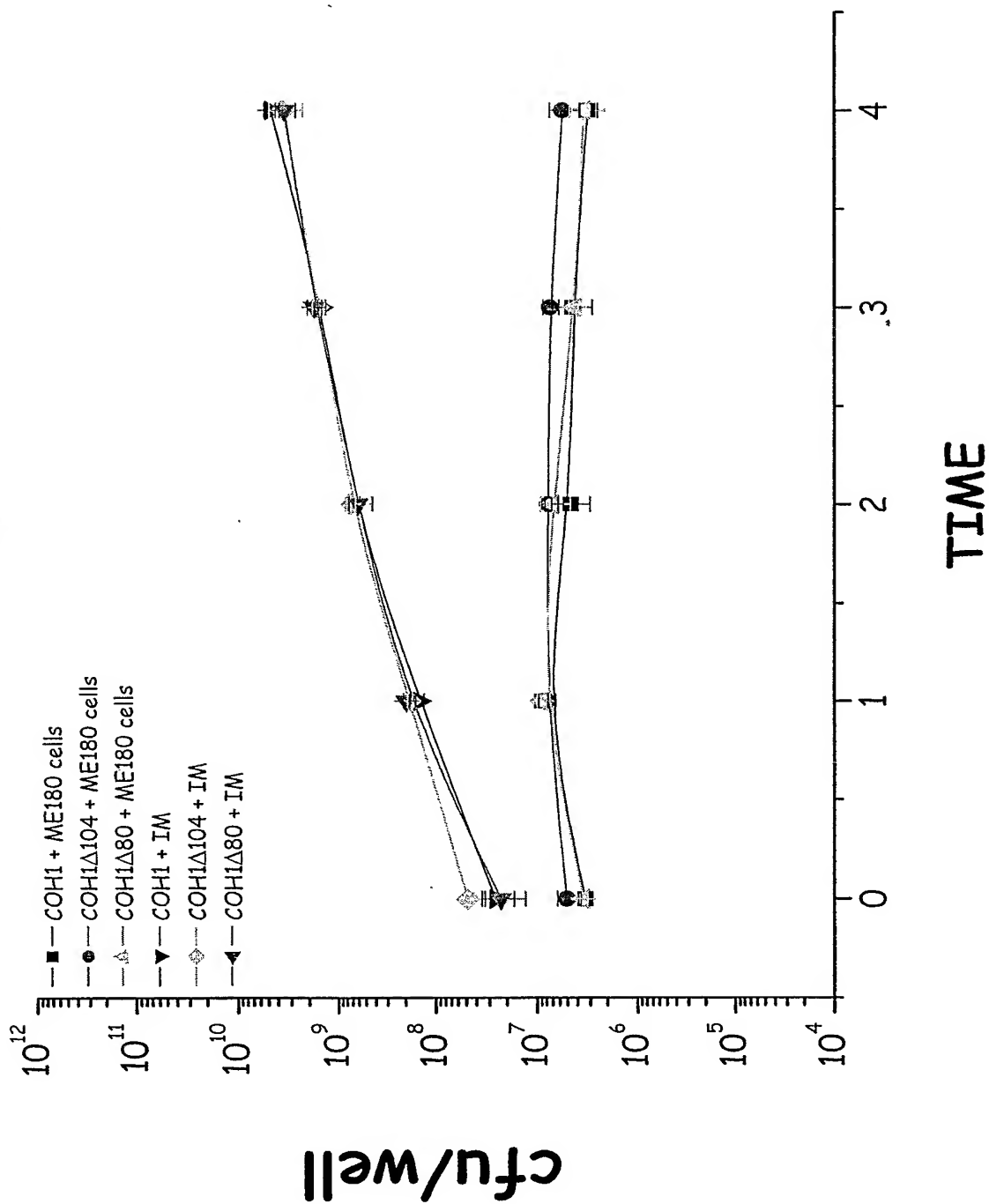


Figure 210

Binding of recombinant GBS104 protein to epithelial cells

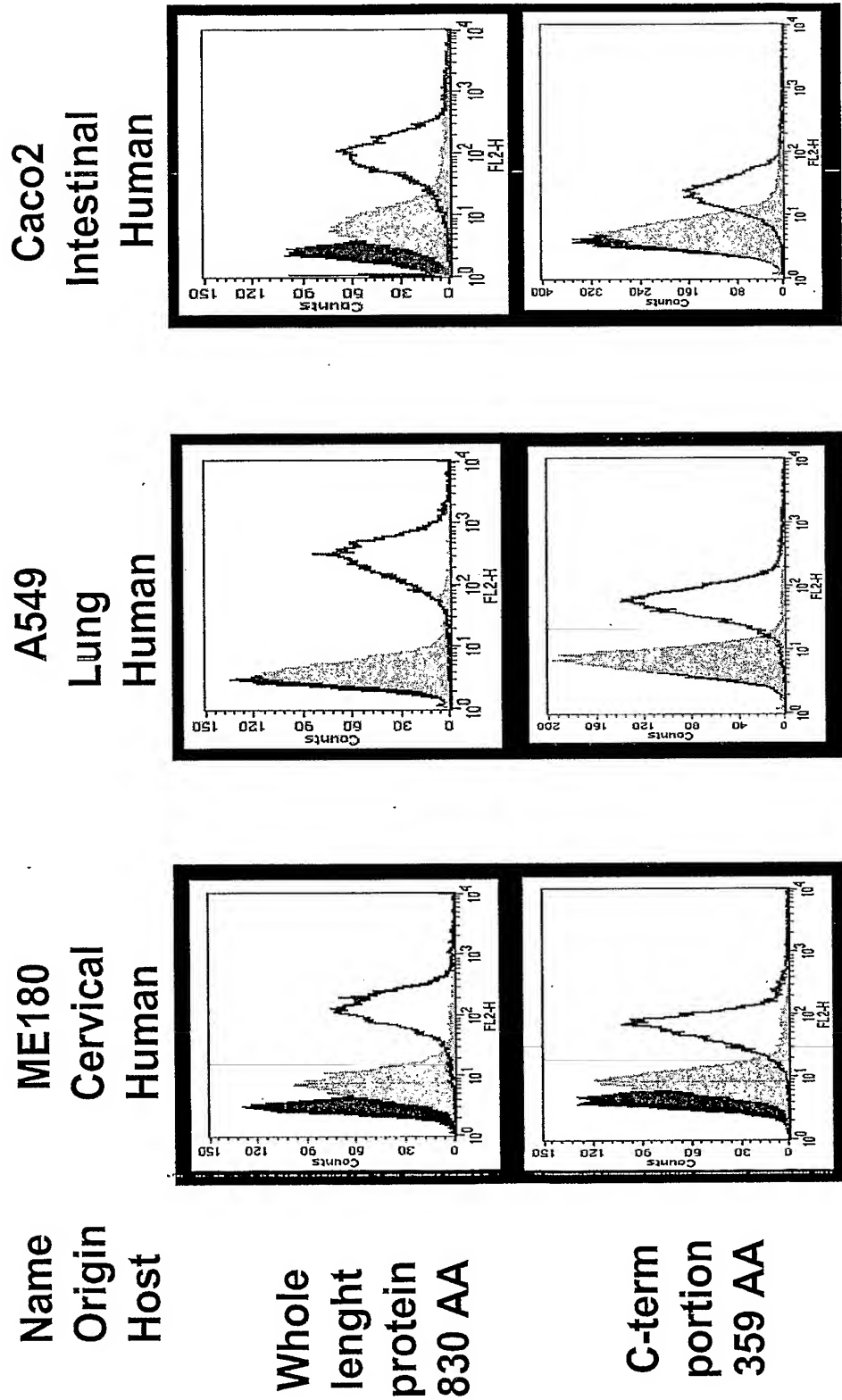
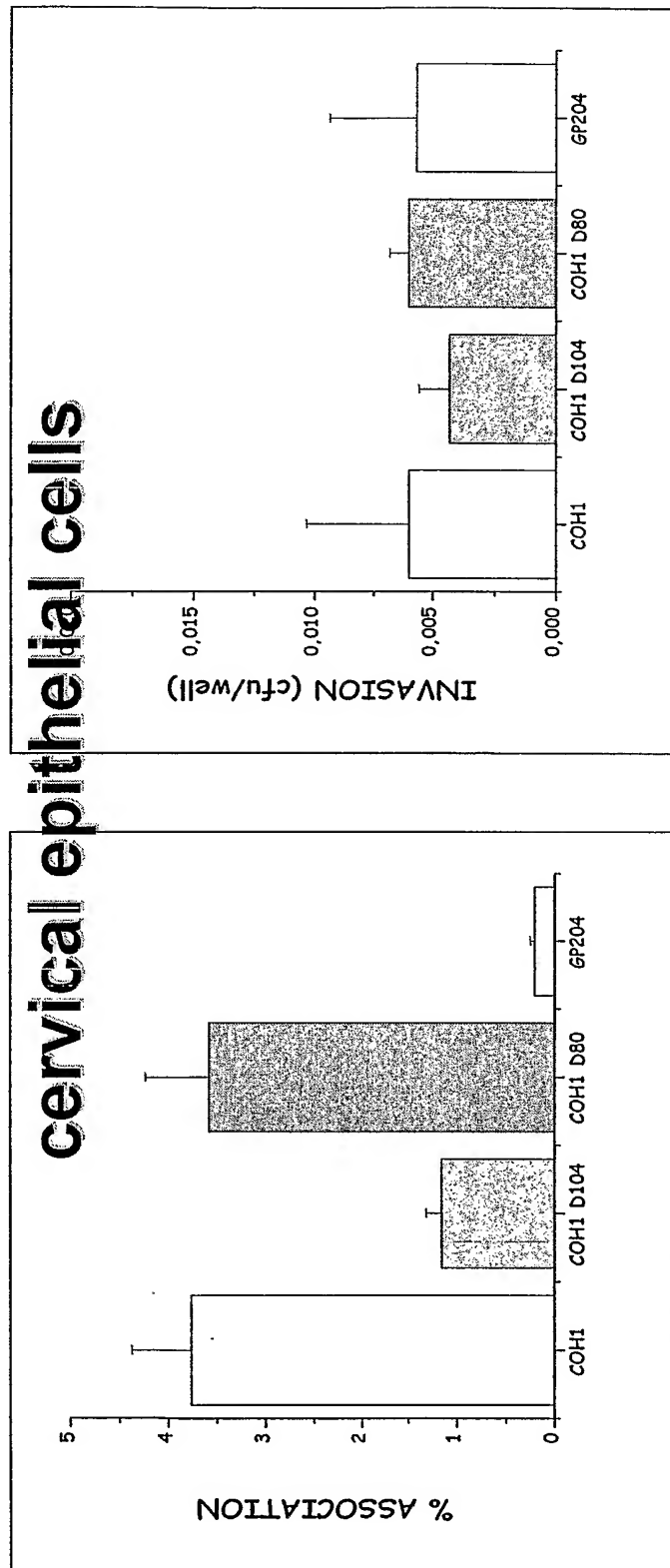


Figure 211

Deletion of GBS104 protein in the GBS strain COH1 reduces the ability of GBS to adhere to ME180



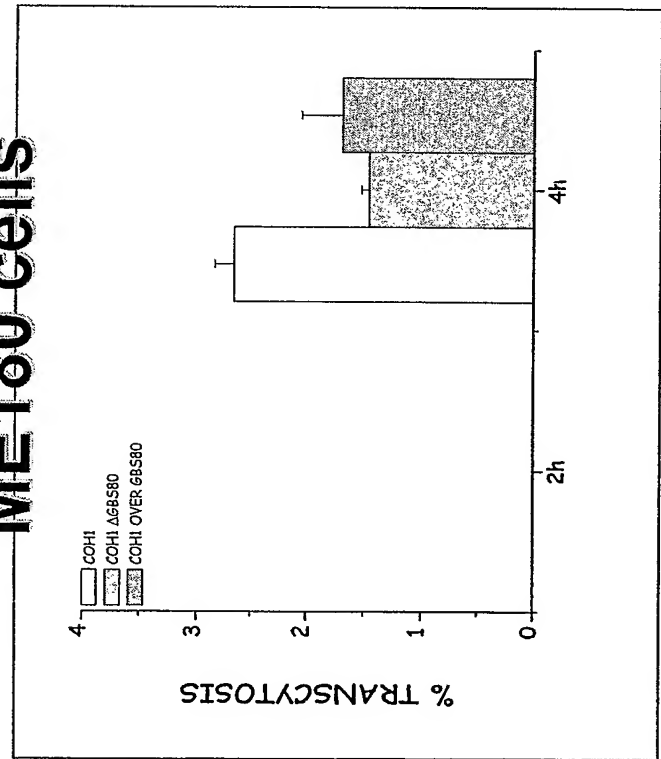
ME180 cervical carcinoma epithelial cells were infected with GBS COH1 wild type or COH1DGBS104/ COH1DGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and cells lysed with 1% saponin and

lactates plated on TSA plates

Figure 212

COH1 overexpressing GBS80 protein has an impaired capacity to translocate through an epithelial monolayer

ME180 cells



Caco2 cells

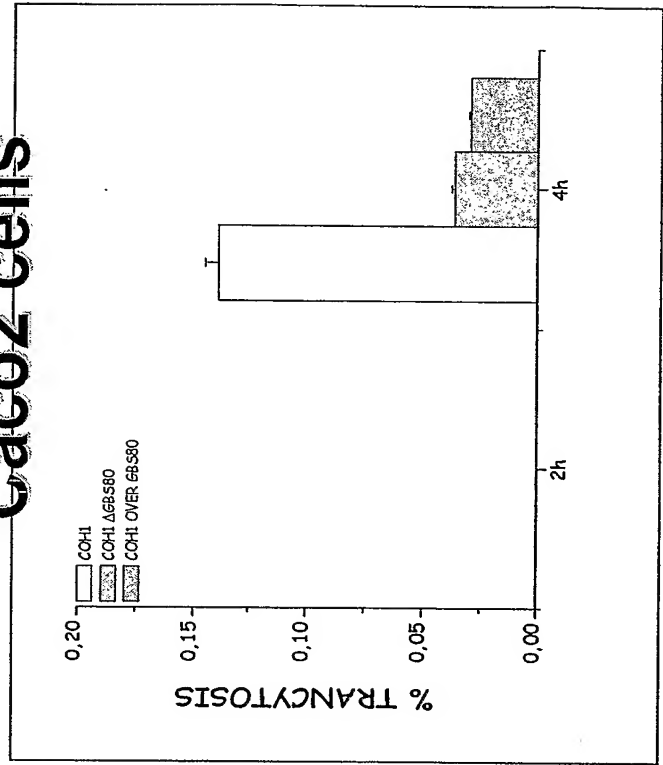


Figure 213

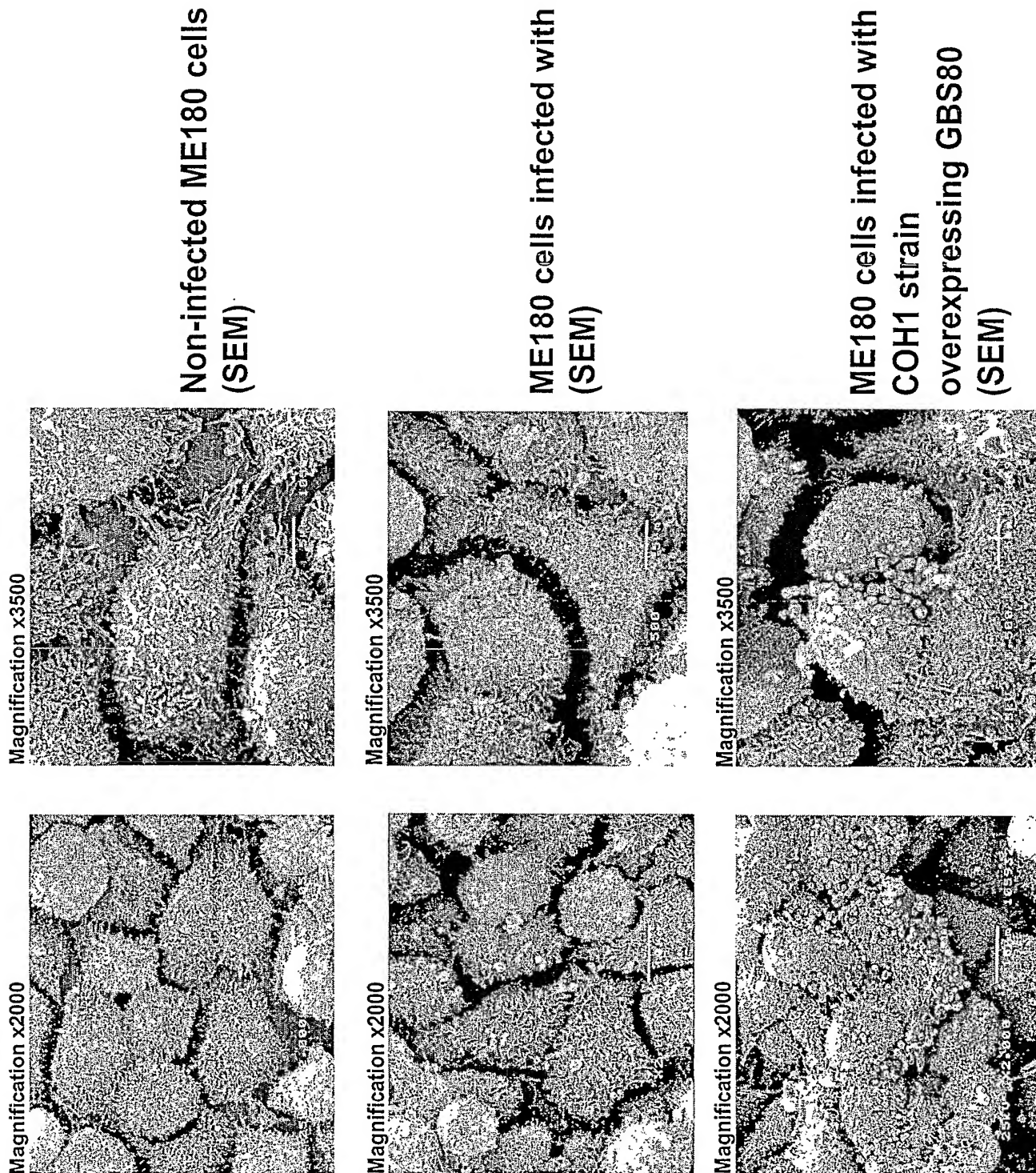
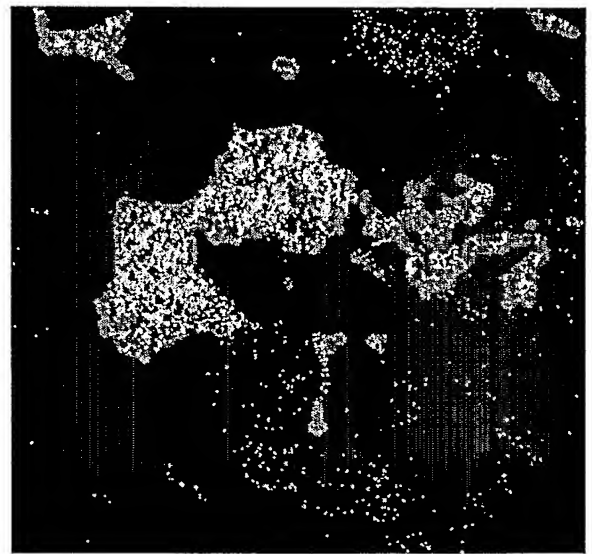
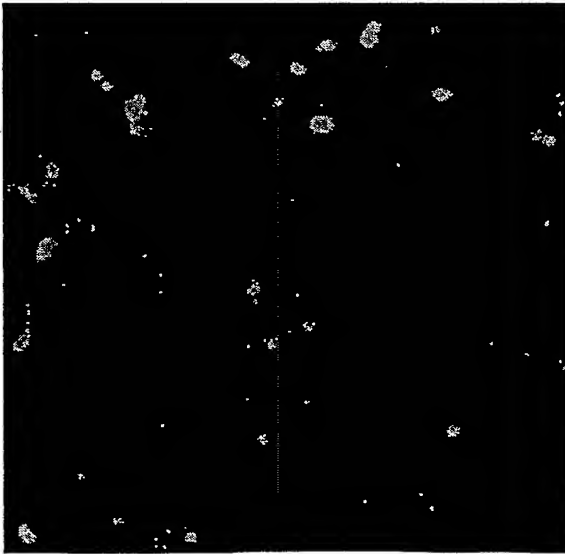
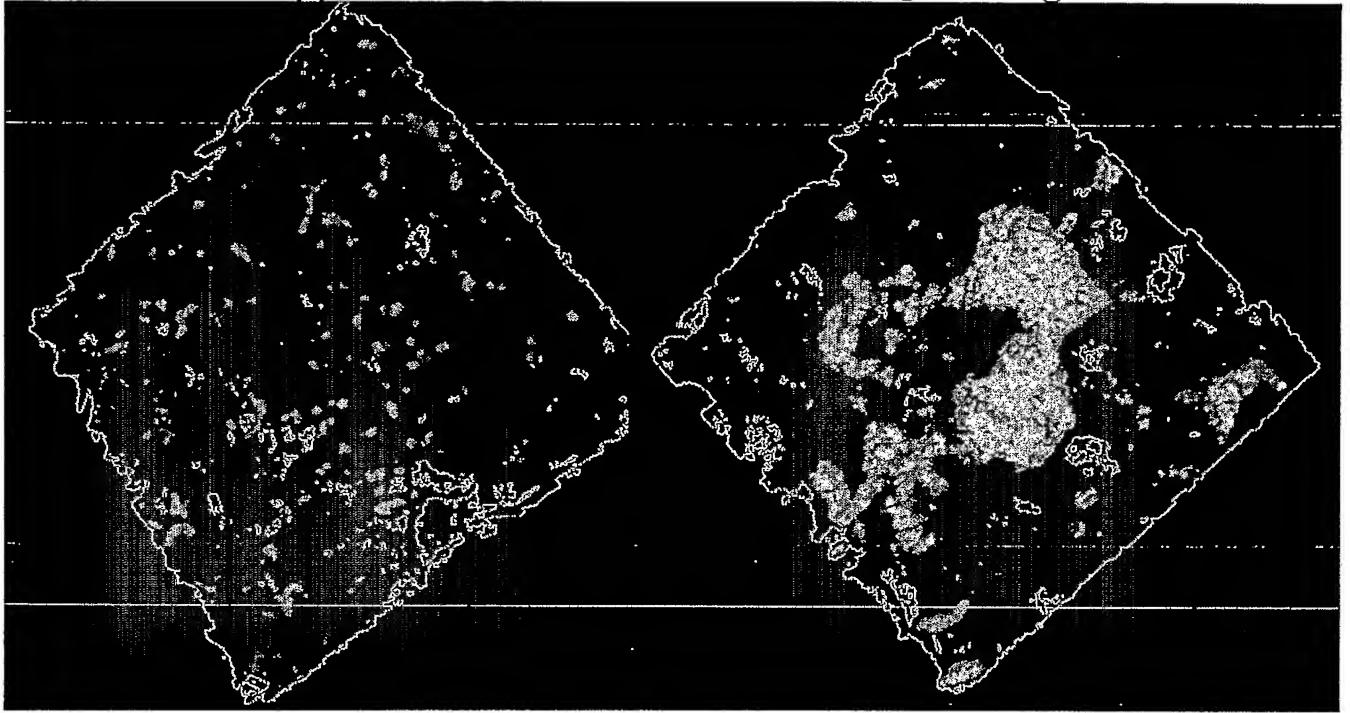


Figure 214

OH1 infection of ME180 cells
F-actin Blue
 α -serotype III capsule Red
 α -GBS80 Green

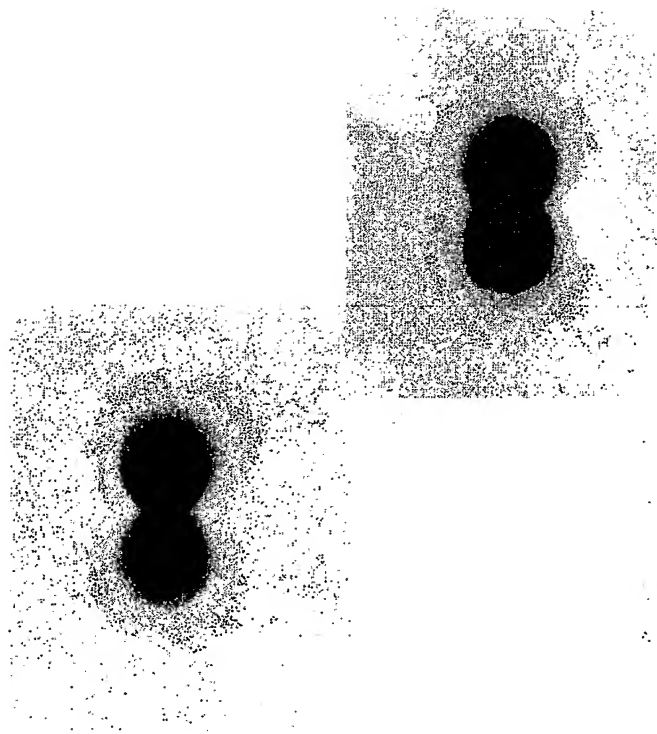
OH1 overexpressing GBS80
infection of ME180 cells
F-actin Blue
 α -serotype III capsule Red
 α -GBS80 Green



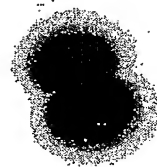
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Figure 215

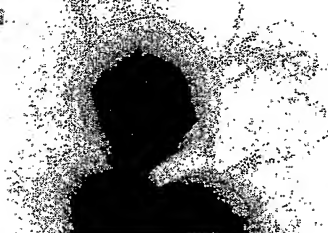
515 WT



515 Δ 59



515 Δ 59p59



α 59

α 59

α 59

Figure 216

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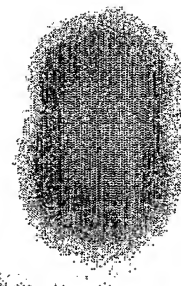
PCT/US2005/027239

515 Δ 67p67

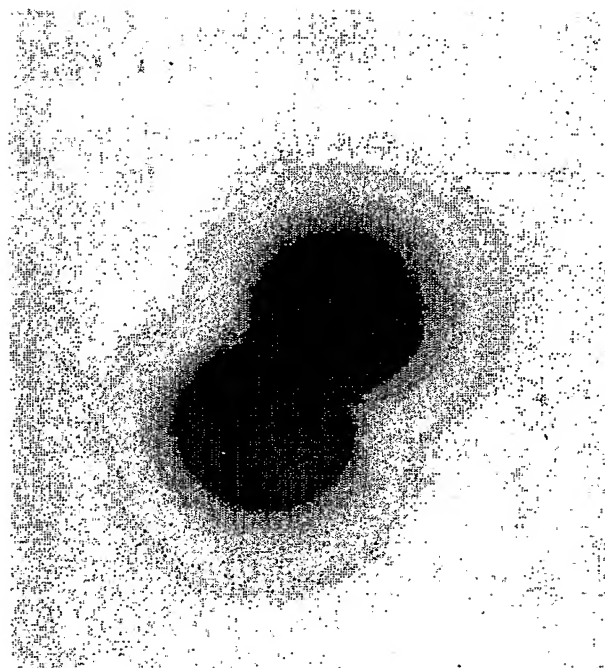


α 67

515 Δ 67



515 WT



α 67

Figure 217
GBS 67 binds to fibronectin

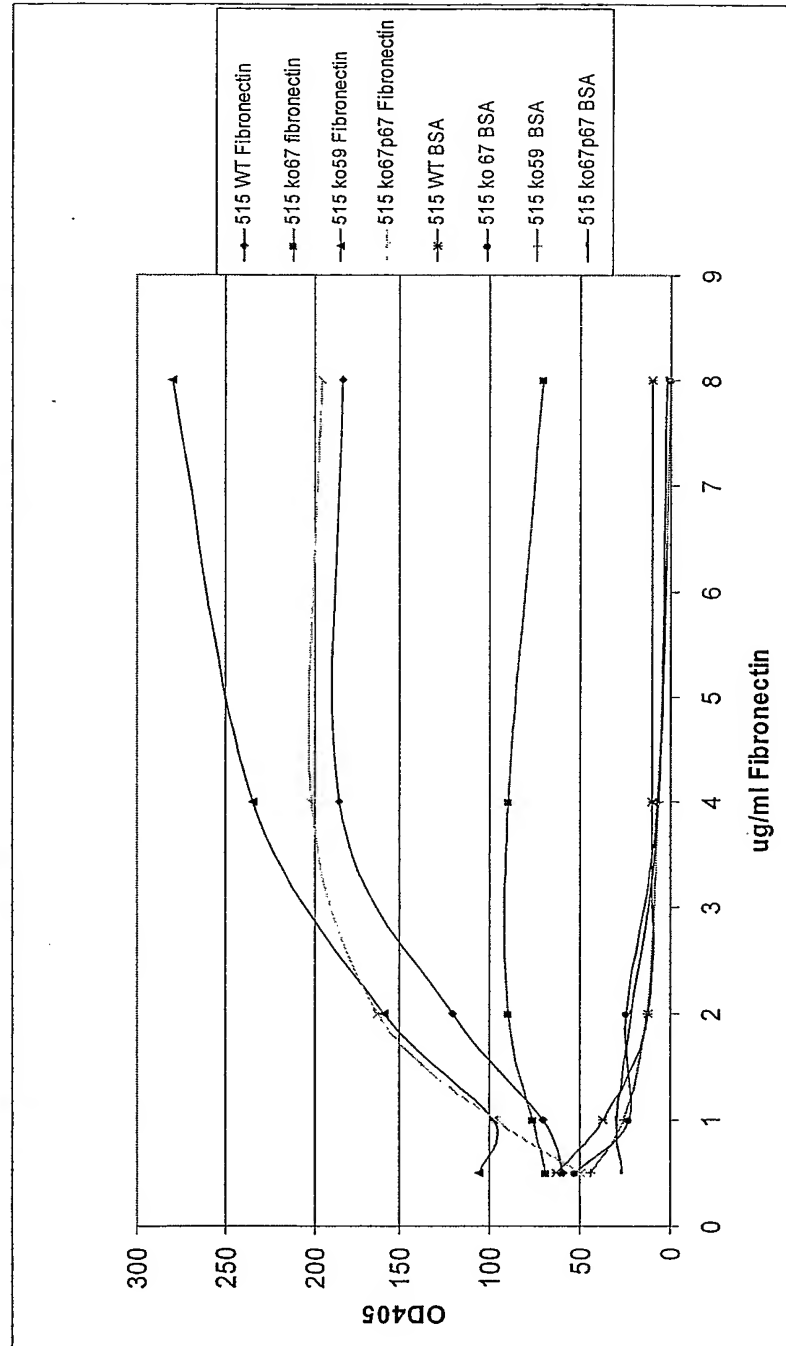


Figure 218

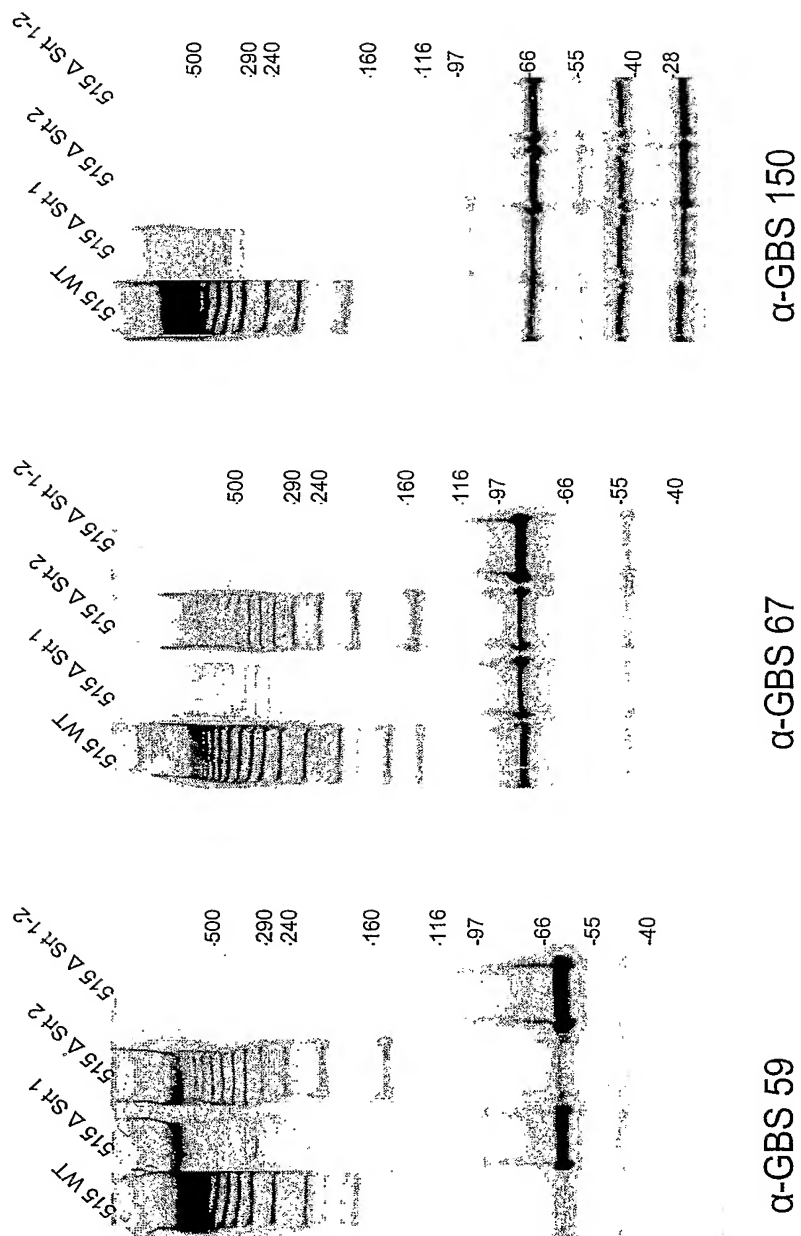
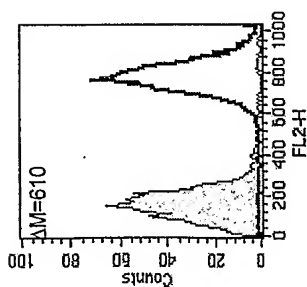
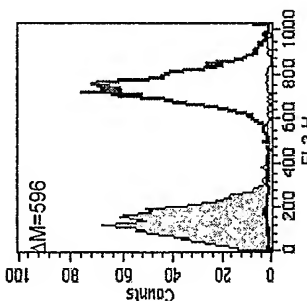


Figure 219

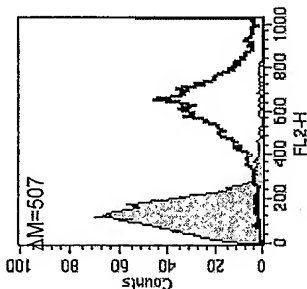
515 WT



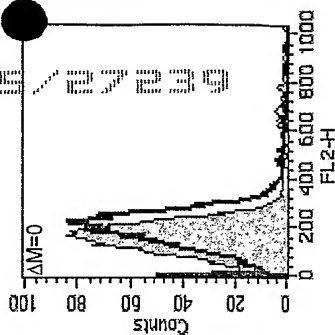
515 Δ Srt 1



515 Δ Srt 2

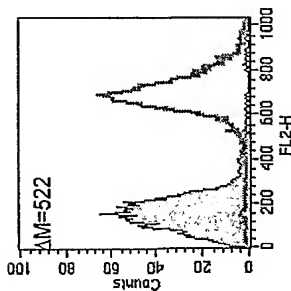


515 Δ Srt 1.2



α59

457/487



α67

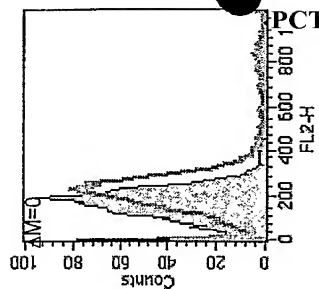
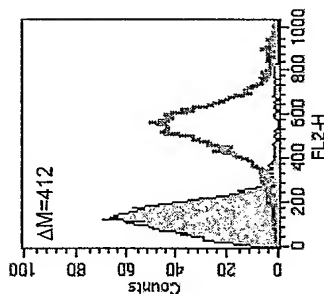
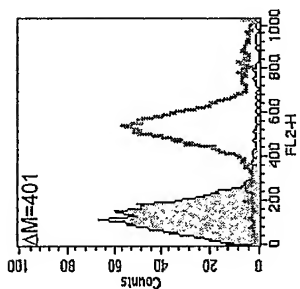
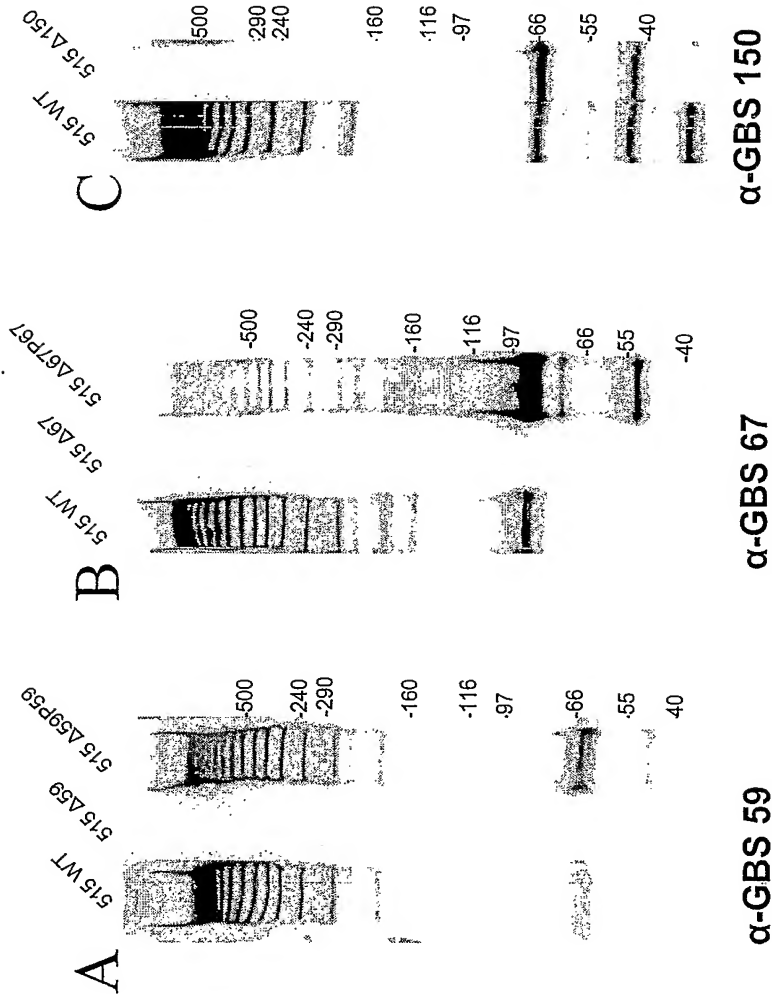
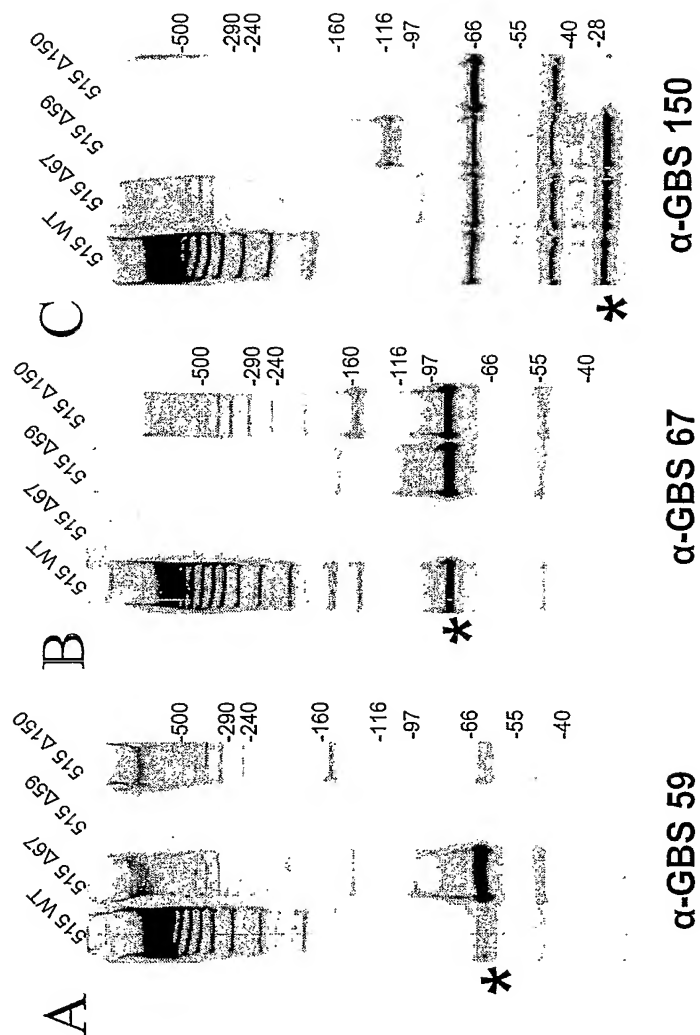


Figure 220



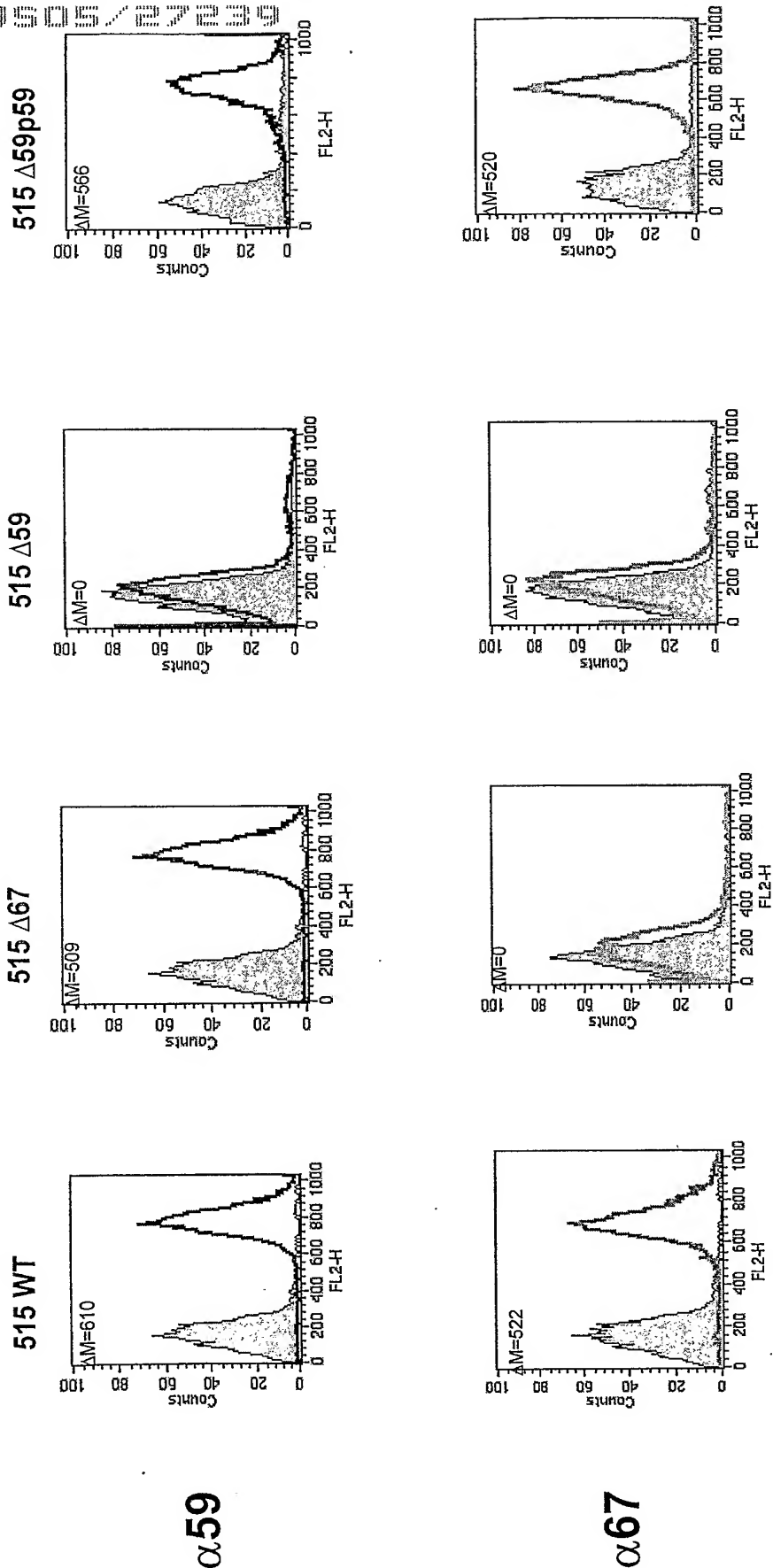
PCT/US05/27239/459/487

Figure 221



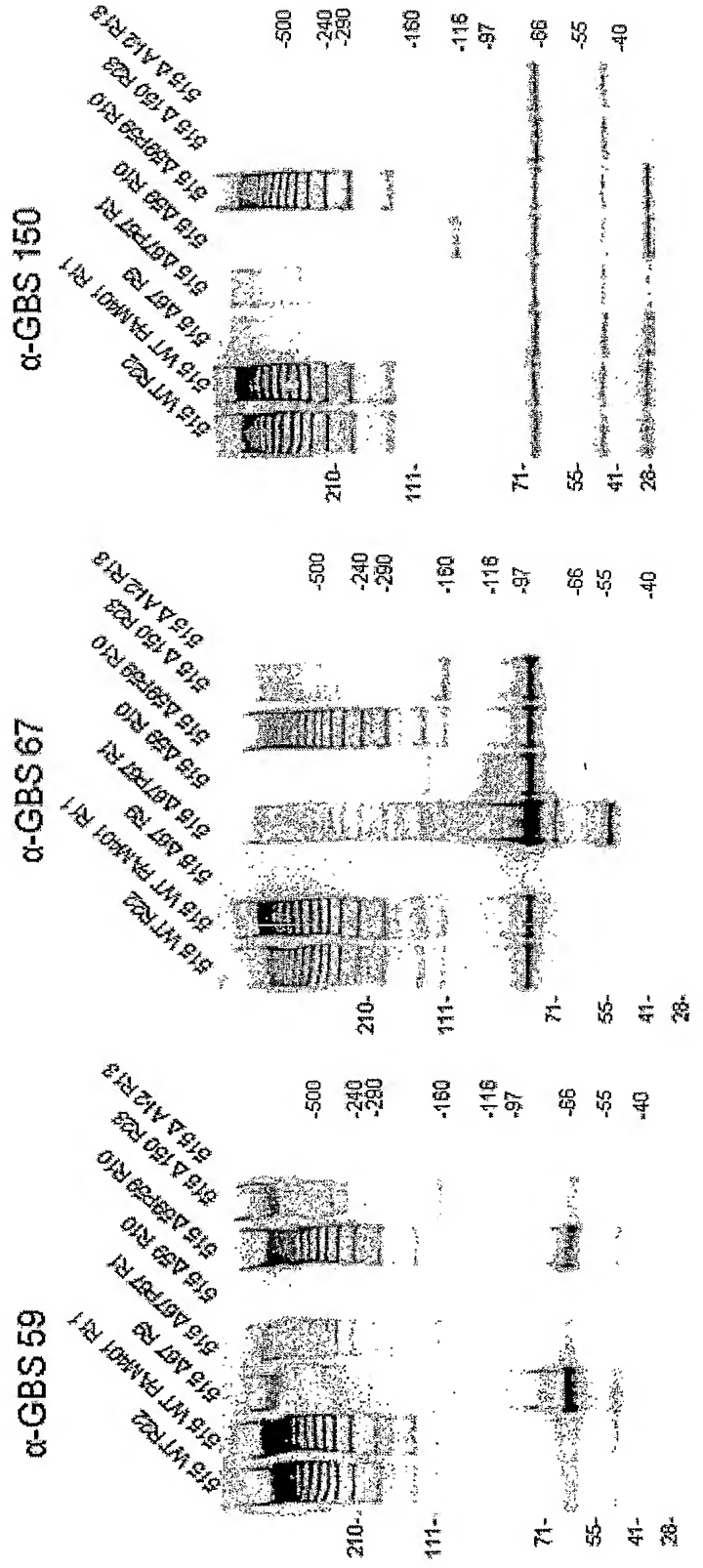
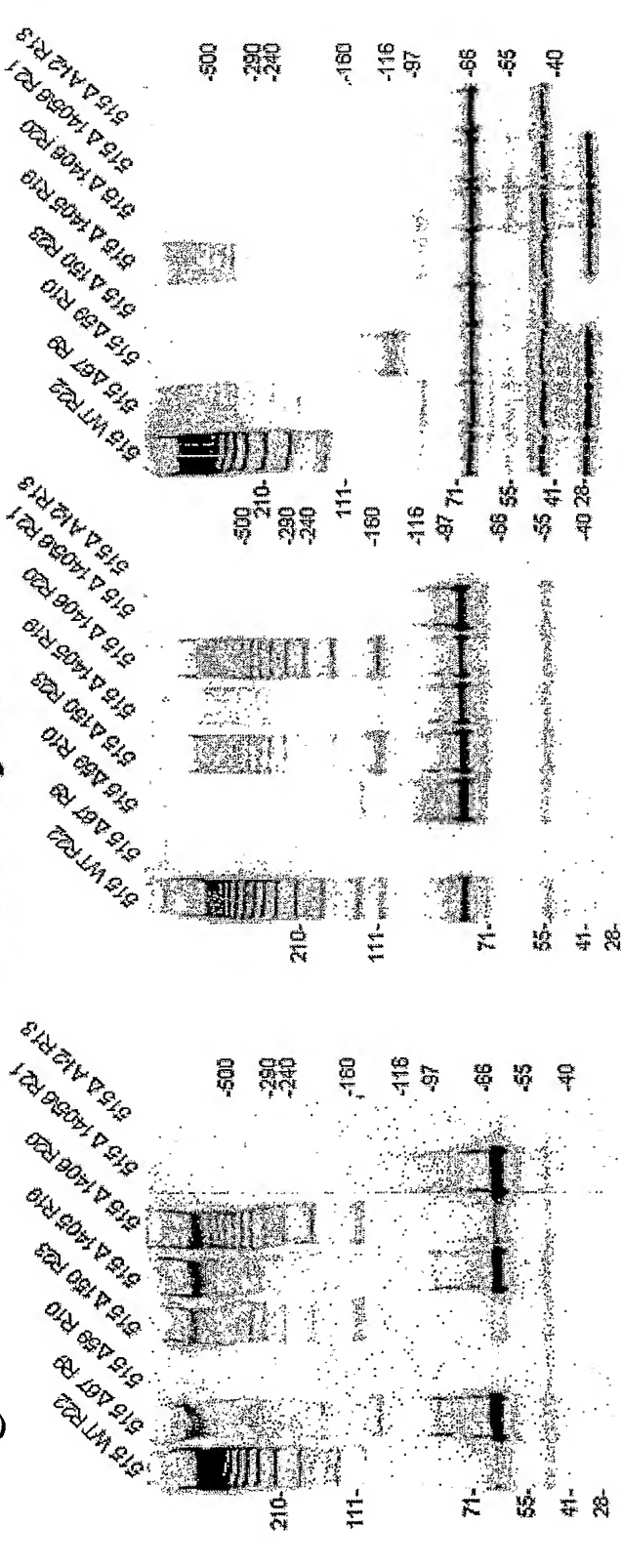
PCT/US05/27239

Figure 222



Summary WB

Figure 223



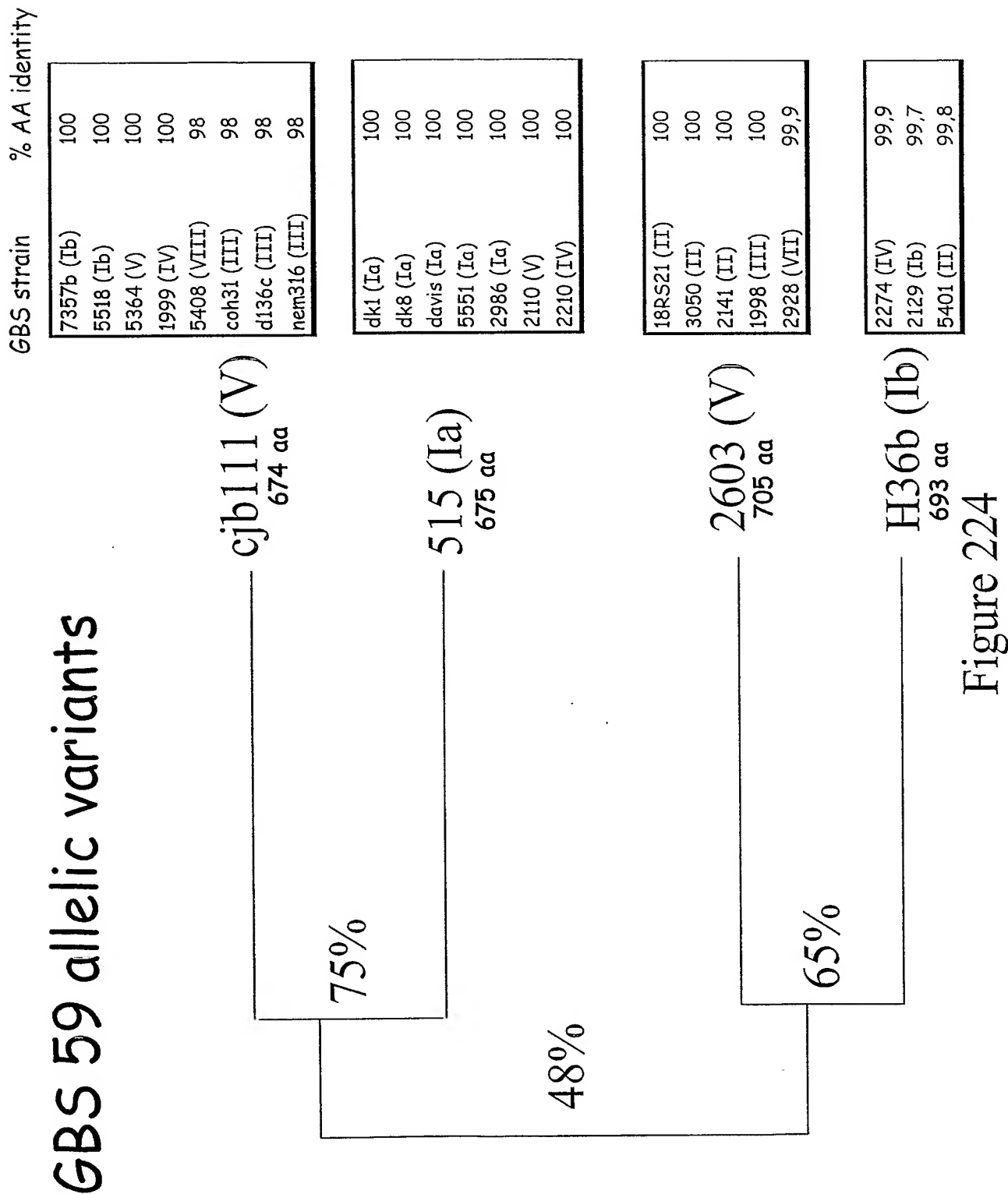
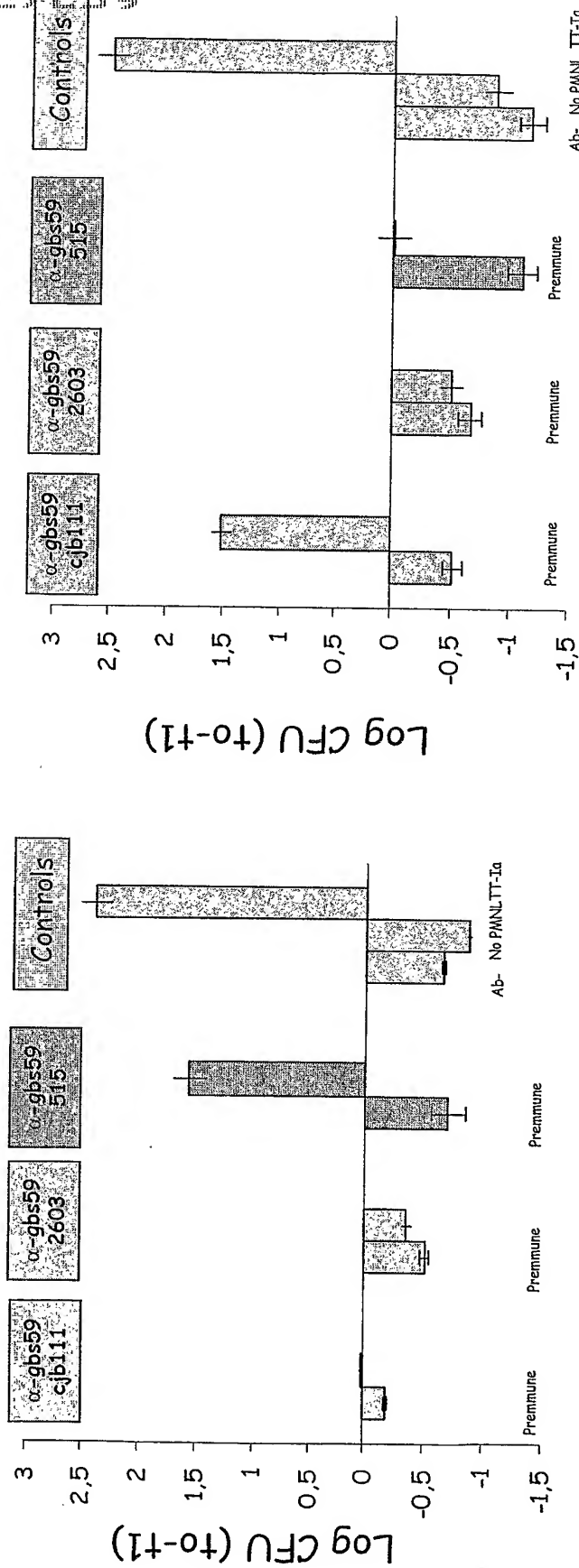


Figure 224

Figure 225

GBS 59 is opsonic only against homologous strain



• 515 (Ia) GBS strain

• cjb111 (V) GBS strain

Figure 226 A

		GBS 59		
GBS strains	Type	PCR	FACS (a-cjb111)	FACS (a-2603)
DK1	Ia	+	565	
DK8		+	559	
Davis		+	577	
515		+	583	0
090		+	0	0
2986		+	443	
5551		+	524	
H36B	Ib	+	0	410
7357b-		+	596	
5518		+	190	
D136C	III	+	504	
COH31		+	505	
1998		+	59	510
18RS21	II	+	0	353
DK21		+	249	0
3050		+	0	570
5401		+	0	400
2141		+	0	371
CJB111	V	+	625	0
2603		+	0	73
5364		+	593	
2110		+	590	0
2274	IV	+	0	400
1999		+	594	
2210		+	636	
5408	VIII	+	537	
CJB110	NT	+	0	0
1169		+	227	0

		GBS 59		
GBS strains	Type	PCR	FACS (a-cjb111)	FACS (a-2603)
A909	Ia	-	22	0
2177	Ib	-	75	
COH1	III	-	0	
M732		-	0	
M781		-	17	
5376		-	60	
5435	VIII	-	55	0
SMU071		-	0	
JM9130013		-	0	

Figure 226 B

Figure 227 A

		FACS (D Mean)				
GBS strains	Type	GBS 80	GBS 104	GBS 67	GBS 322	GBS 59
DK1	Ia	0	0	478	153	565
DK8		0	0	475	213	559
Davis		0	0	430	86	577
515		0	0	409	227	583
090		0	0	0	0	0
A909		46	29	0	0	0
2986		0	0	397	0	443
5551		0	0	485	36	524
2177	Ib	477	355	66	323	0
H36B		0	0	444	105	410
7357b-		91	0	316	102	596
5518		31	0	162	0	190
COH1	III	305	226	0	130	0
D136C		40	40	406	460	504
COH31		0	0	273	479	505
M732		141	101	0	292	0
M781		111	136	0	224	0
1998		140	77	350	288	510
5376		165	156	0	76	0
5435		93	100	0	88	0
18RS21	II	0	0	103	471	353
DK21		0	0	331	342	249
3050		71	46	460	188	570
5401		75	28	618	135	400
2141		0	0	370	76	371
CJB111	V	365	236	481	58	625
2603		62	0	105	293	73
5364		454	281	394	463	593

2110		0	0	589	0	590
2274		123	62	484	161	400
1999	IV	0	389	453	55	594
2210		0	0	574	0	636
SMU071		556	393	74	170	0
JM9130013	VIII	587	436	72	133	0
5408		0	0	433	0	537
CJB110		0	0	245	587	0
1169	NT	0	0	443	213	227
D Mean > 200		6/37 (16%)	7/37 (19%)	24/37 (65%)	14/37 (38%)	24/37 (65%)

Figure 227B

Figure 228

		FACS (ΔMean)																Δmean
GBS Strain	Type	GBS 80 142-F		GBS 104 Mab		GBS 322 86		GBS 67 81		GBS 67 H36B		GBS 59 2603		GBS 59 CJB111		GBS 59 515		neg. control
cdc-1	II	114	95	0	0	122	122	360	341	422	403	92	73	254	235	306	287	19
cdc-2	IB	173	69	92	0	95	75	552	448	590	486	135	31	635	531	197	93	104
cdc-3	II	566	508	360	302	85	60	364	306	433	375	111	53	448	390	310	252	58
cdc-4	V	524	432	337	245	284	204	577	485	625	533	105	13	674	582	303	211	92
cdc-5	II	140	0	0	0	462	300	487	297	563	373	175	0	373	183	440	250	190
cdc-6	V	544	484	361	301	95	95	586	526	601	541	55	0	686	626	302	242	60
cdc-7	III	155	116	44	5	134	118	95	56	138	99	74	35	92	53	91	52	39
cdc-8	III	347	304	192	149	74	62	98	55	170	127	72	29	88	45	108	65	43
cdc-9	II	89	65	0	0	226	191	390	366	504	480	181	157	317	293	410	386	24
cdc-10	IA	46	24	0	0	152	152	494	472	531	509	43	21	16	0	48	26	22
cdc-11	IA	17	0	0	0	295	135	569	550	569	550	47	28	467	448	648	629	19
cdc-12	V	439	430	290	281	60	30	174	165	227	218	52	43	139	130	207	198	9
cdc-13	IA	33	0	0	0	216	146	469	436	469	436	100	67	361	328	571	538	33
cdc-14	III	78	68	10	0	213	191	50	40	85	75	38	28	69	59	67	57	10
cdc-15	III	119	53	24	0	108	98	48	0	127	61	89	23	105	39	100	34	66
cdc-16	V	363	335	177	149	310	270	70	42	127	99	48	20	130	102	128	100	28
cdc-17	III	160	0	163	0	408	248	377	217	410	250	441	281	359	199	167	7	160
cdc-18	III	49	28	0	0	239	218	34	13	36	15	16	0	49	28	56	35	21
cdc-19	III	182	101	0	0	361	280	310	229	312	231	384	303	220	139	0	0	81
cdc-20	V	348	304	203	159	380	336	166	122	211	167	114	70	232	188	128	84	44
cdc-21	II	222	132	83	0	150	60	331	241	336	246	0	0	420	330	59	0	90
cdc-22	IA	0	0	13	13	43	43	238	238	238	238	43	43	38	38	429	429	0
cdc-22 (9-6-05)		23	0	34	0	110	20	310	220	320	230	113	23	117	27	344	254	90
cdc-23	V	484	484	374	374	278	278	124	124	206	206	11	11	91	91	236	236	0
cdc-24	V	137	52	0	0	333	248	90	5	110	25	110	25	120	35	70	0	85
cdc-25	IA	0	0	0	0	351	190	530	370	565	405	495	335	442	282	625	465	160
cdc-26	II	117	2	0	0	185	70	210	95	285	170	30	0	175	60	210	95	115
cdc-27	III	323	95	34	0	498	270	346	118	406	178	424	196	314	86	64	0	228
cdc-28	V	150	92	20	0	132	74	462	404	505	447	0	0	526	468	78	20	58
cdc-29	IV	90	73	65	48	195	178	90	73	150	133	150	133	138	121	110	93	17
cdc-30	V	390	187	336	133	348	145	229	26	244	41	113	0	268	65	223	20	203
cdc-31	IA	22	0	68	0	306	182	368	244	386	262	126	2	248	124	426	302	124
cdc-32	IA	45	0	12	0	260	175	190	105	205	120	30	0	100	15	185	100	85
cdc-33	II	50	0	0	0	306	156	134	0	237	87	4	0	180	30	190	40	150
cdc-34	III	152	60	47	0	342	250	44	0	74	0	27	0	102	8	48	0	92
cdc-35	V	227	227	40	40	246	246	395	395	415	415	0	0	550	550	142	142	0
cdc-36	IB	25	15	8	0	30	20	154	144	174	164	33	23	222	212	20	10	10
cdc-37	III	168	53	61	0	361	246	82	0	133	18	83	0	132	17	75	0	115
cdc-38	II	140	14	30	0	338	212	124	0	198	72	158	32	138	12	104	0	126
cdc-39	II	126	0	0	0	316	148	466	298	514	346	438	270	184	16	34	0	168
cdc-40	V	420	366	214	160	22	0	103	49	162	108	90	36	209	155	192	138	54
cdc-41	II	146	31	15	0	380	265	330	215	425	310	140	25	280	165	315	200	115

Figure 229

Expected strain coverage

MIX GBS proteins

n. antigens FACS	vaccine options					w/o 322			w/o 104+322			w/o 59+322		
	80+104+67+59+322	80+104+67+322	80+104+67+59	80+104+67+59	80+104+67+59	80+104+67+322	80+104+67+59	80+104+67+59	80+104+67+322	80+104+67+59	80+104+67+59	80+104+67+322	80+104+67+59	80+104+67+59
1	89%	89%	89%	80%	80%	89%	80%	80%	79%	79%	79%	74%	74%	74%
2	74%	74%	51%	71%	71%	51%	71%	64%	24%	24%	24%	16%	16%	16%
3	23%	23%	14%	17%	17%	14%	17%	16%	13%	13%	13%	16%	16%	16%

- GBS 322 but not GBS 59 is important to increase strain coverage
- GBS 59 probably could be useful to increase the vaccine strength

Assumption:

- Protein antigens that are highly accessible to antibodies confer 100% protection with suitable adjuvants

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Figure 230

GBS 59 opsonophagocytic activity is comparable to that of the four-protein mix

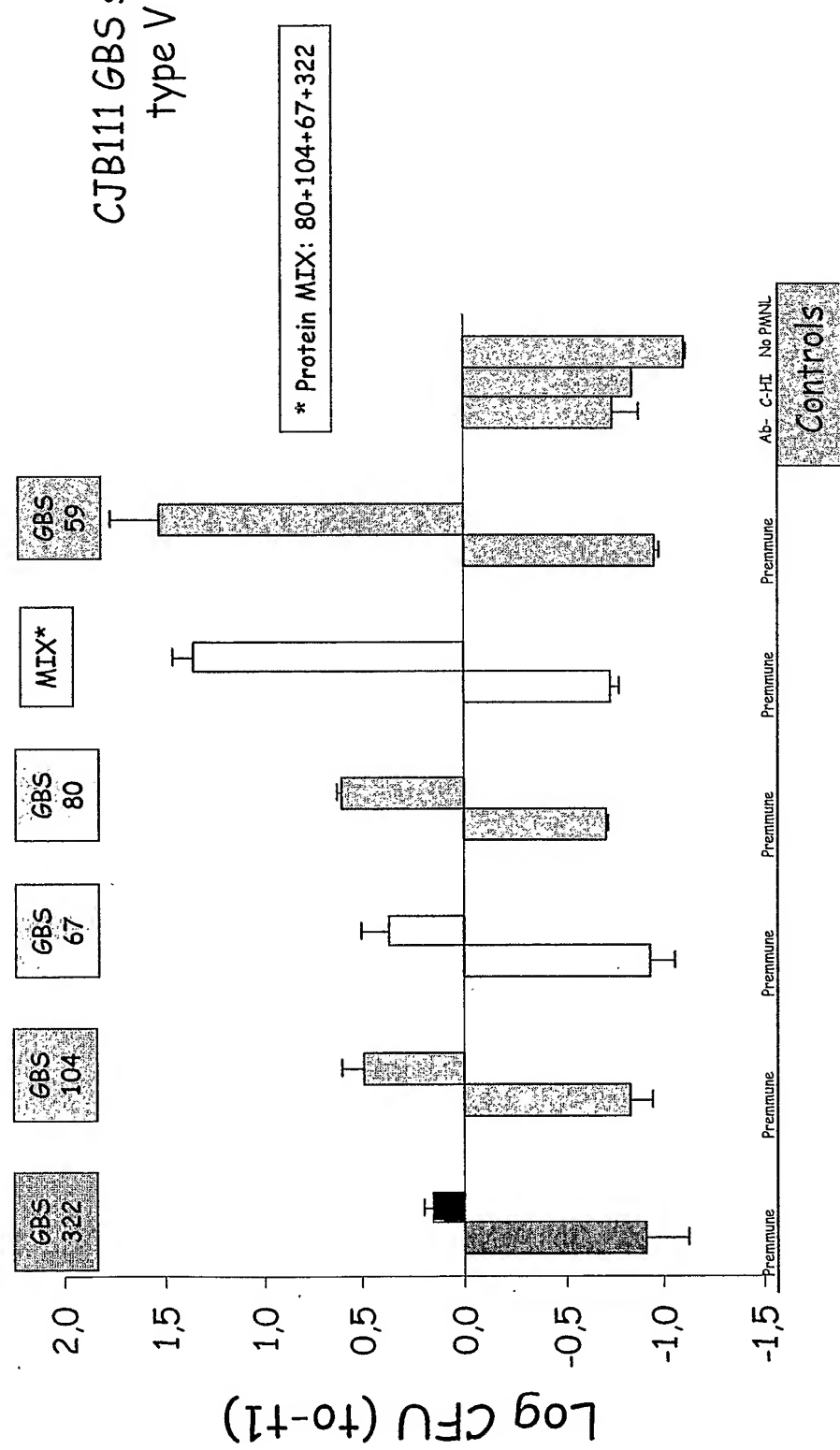


Figure 231

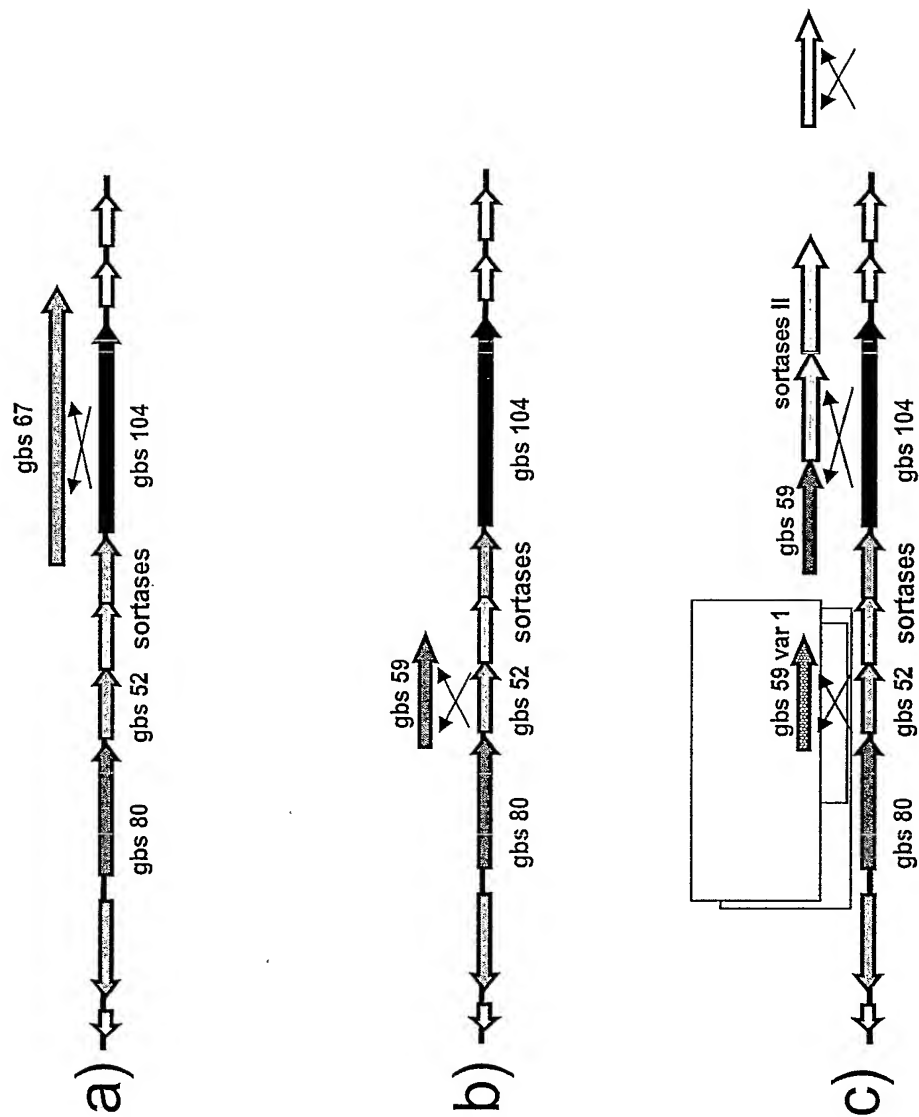
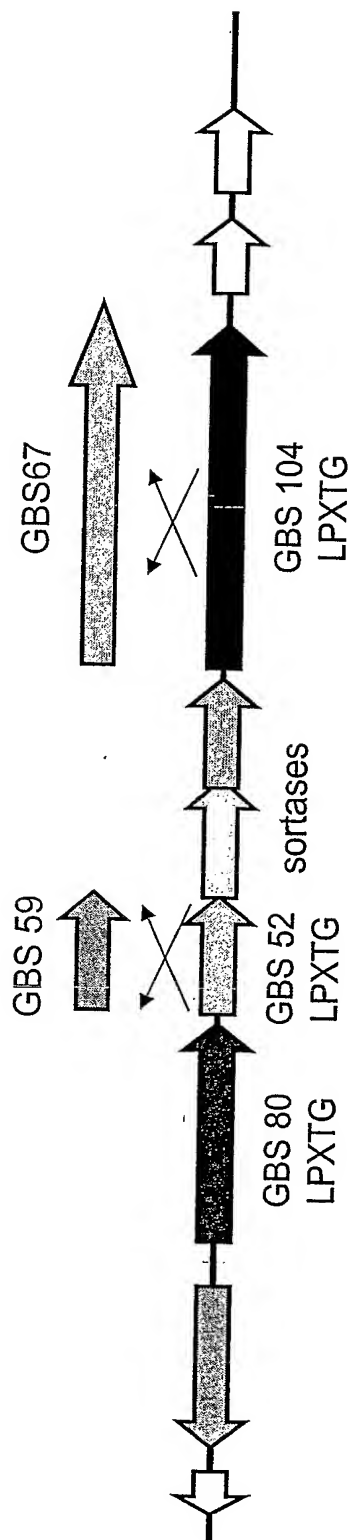


Figure 232



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Figure 233

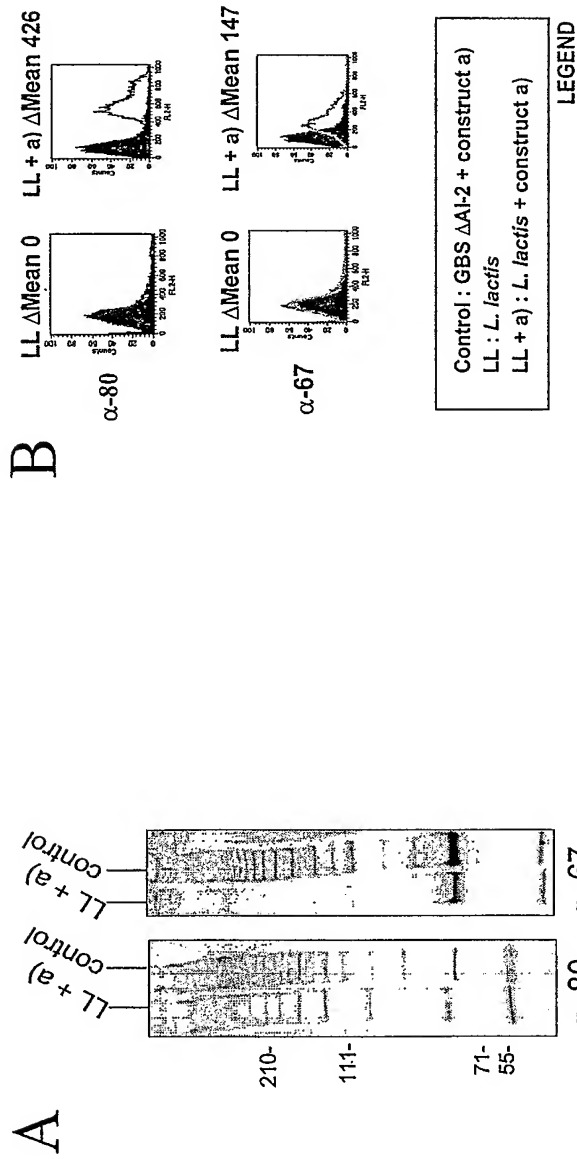
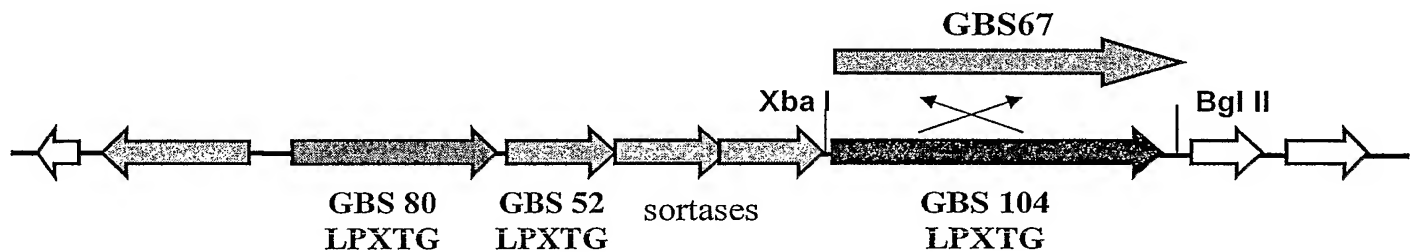


Figure 234 A

Introducing Heterologous Antigens into AI-1 pilus to Obtain Protection Across GBS Strains

1- Substitution of GBS 104 with GBS67 from Island II

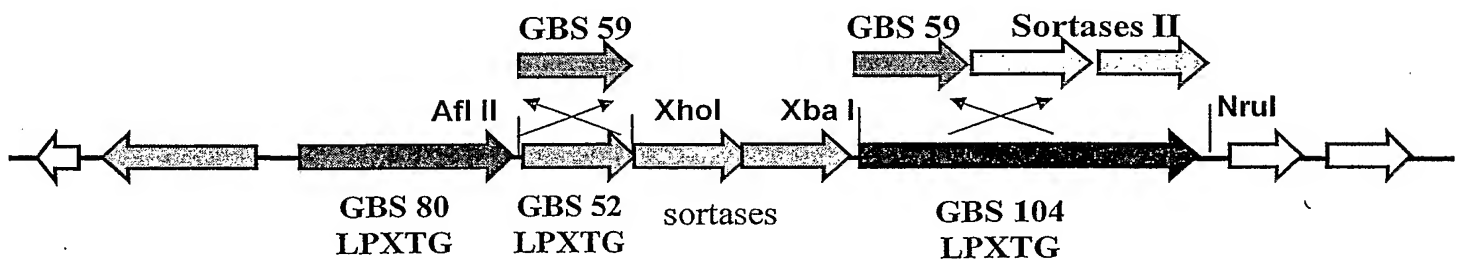


Oligo GBS67pAMXbafor AGTCAGTCTCTAGACGGCACAATAGGAGTTGTAAA

Oligo GBS67pAMBglrev CACCTGTCATAGATCTTAAGAATACTAAAGCGCATAA

2- Substitution of GBS52 or 104 with:

- GBS 59 alleles 515 or CJB
- GBS 59 allele CJB111 + sortases island II
- GBS 59 allele 515 + GBS 59 CJB111 + sortases island II



DETAILS:

a) Oligos to be used:

Oligo 59pAMAflfor1 AGTCAGTCCTTAAGCCGCATATTATTAATCATGTTG (allele 515)

Oligo 59pAMAflfor1 AGTCAGTCCTCGAGTTAACTTCCTCTGATTGACG (allele 515)

Oligo 59pAMAflfor2 AGTCAGTCCTTAAGAAGGAGTGGTGCTGCGGTAA (allele CJB111)

Oligo 59pAMXhorev2 AGTCAGTCCTCGAGTTAAGCTTCCTCTGATTGACG (allele CJB111)

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b) Oligos to be used:

Oligo GBS59XbaF CTAGTGATATATCTAGAGAAAAAG

Oligo Sort59NruR CTAGCTAGTCGCGACTTTTTCATTTTGGATTTCCCTTTC

Figure 234 B

3- Substitution of GBS104 with a fusion of GBS322-GBS67 to include GBS 322 into AI-1

- a) Construct 1: GBS67 complete sequence included
- b) Construct 2: Only part of GBS 67 was included (*deleted bold region*)

DETAILS:

a) Construct 1:

Legend:

Pink GBS322

Black GBS67

Black Bold: fragment of GBS67 eliminated in construct 2

Green PK motifs

Yellow E motifs

Red LPXTC

> gbs67-515 + 322

```
MRKYQKFSKILTLSLFCLSQIPLNTNVLGESTVPENGAKGKLVVKKTDQNKPLSKATFV
LKTTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAPEGYKKTNQTWQVKVESNGKT
TIQNSGDKNSTIGQNQEELDKQYPPTGIYEDTKESYKLEHVKGSPNGKSEAKAVNPYSS
EGEHIREIPEGTLKRISVGDLAHNKYKIELTVSGKTIVKPVDKQKPLETDTTWTARTVSEV
KADLVKQDNKSSYTVKYGDTLSEAMSIDMNVYLAKINNIADINLIYPETTLTYDQKSHTA
ISMKIETPATNAACOTTATVDLKTNDQVSVADOKVSLNTISEGIMTPEAATTIVSPMKTYSSAF
ALKSKEVLAEQAVSQAAANEQVSPAPVKSITSEVPAAKEEVKPTQTSVSQSTTVSPASVA
AETPAPVAKVAPVRTVAAPRVASVKVYTRK VETGASPEHVSAPAVPVTTTSPATDSKLOAT
EVKSPVPAQKAPTATPVAQPASTTNAAHPENAGLQPHVAAYKERVASTYGVNEESTYRAC
DRGDHGKGLAVDFIVGTNQAALGNKVAQYSTQNMAANNISYVIWQOKFYSN
INSYGPANTWINAMPDRGGVTANNDHVHVSENKDWWFVLDNSMS
MNNDGPNFQRHNKAKKAAEALGTAVKDILGANSNDRVALVTYGSDFDGRSVDVVKGFKE
DDKYYGLQTKFTIQTENYSHKQLTNNAEEIIRIPTEAPKAWGSTTNGLTPEQQKEYYL
SKVGETFTMKAFMEADDILSQVNRNSQKIIVHVTGVPTRSYAINNFKLGASYESQFEQM
KKNGYLNKSNFLITDKPDDIKNGESYFLPLDSYQTQIISGNLQKLHYLDLNLNPKGI
IYRNGPVKEHGTPTKLYINSLKQKNYDIFNFGIDISGFRQVYNEEYKKNQDGTGFKLKEE
```

AFKLS DGEITELMRSFSSKPEYYTPIVTSADTSNNEILSKIQQQFETILTKENSIVNGTI
EDPMGDKINLQLGNGQILQPSDYTLQGNDGSVMKDG IATGGPNNDGGILKGVKLEYIGNK
LYVRGLNLGEGQKVTLTYDVKLDDSFISNKFYDTN GR TTL NPK SEDPNTLRDFPIPI RD
VREYPTITIKNEKKLGEIEFIKVDKDNKKLLK GATFELQEFNEDYKLYLPIKNNNSKV
TGENGKISYKDLKDGKYQLIEAVSPEDY QKITNKPILTFEVVKGSIKNIIAVNKQISEYH
EEGDKHLITNTHIPPKGI KILSGILSFILIGGAMMSIAGGIYIWKRYKKSSDMSIKK
D

Figure 234 C

b) Construct 2:

>gbs67-515 deleted+ 322

MRKYQKFSKILTLSLFCLSQIPLNTNVLGESTVPENGAKGKLVVKKTTDDQNKPLSKATFV
 LKTTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAPEGYKKTNQWQVKVESNGKT
 TIQNSGDKNSTIGQNQEELDKQYPPTGIYEDTKESYKLEHVKGSPNGKSEAKAVNPYS
 SEGEHIREIPEGTLSEVVDLAHNKYKIETVSGKTIVKPVDPKQKPLETDTTW
 TARTVSEVKADLVKQDNKSSYTVKYGDTLSVISEAMSIDMNVLAKINNIADINLIYPETTLIV
 IYEQKSHATATSMKIETPATNAAGOTTATVBLKTNQVSVADQKVSLENTISEGMITPEAATT
 VSPMKTYSSAPALKSKEVLAQEQAVSQAAANEQVSPAPVKSITSEVPAAKEEVKPTQTS
 VSOSTTVGPAASVAETPAPVAKVAPVRTVAAPRVASVKVTPKVVETGASPEHVSAPAVE
 VTTTSPATDSKELQATEVKSVPVAQKAPTATVAPASTTNAVAHPENAGLOPHVAAYK
 EKVASTYGVNEFSTYRAGDPGDHGGKGLAVDFMGTNQALGNKYAQYSTONMAANNISY
 WQQKEYSNTNSIYGPANTWNAMPDRGCVTANHMDHVHVSFNKGESYFLPLDSYQQT
 IISGNLQKLHYLDLNLNYPKGTIYRNGPVKEHGTPTKLYINSLKQKNYDIFNFGIDISGRQ
 VYNEEYKKNQDGTGFKLKEEAFKLSDEITELMRFSKPEYYTPIVTSADTSNNEILSKI
 QQQFETILTKENSIVNGTIEDPMGDKINLQLGNGQILQPSDYTLQNDGSMKDGATGG
 PNNDGGILKGKLEYIGNKLYVRGLNLGEGQKVTLTYDVKLDDSFISNKFYDTNGRTTLN
 PKSEDPNTLRDFPIPKIRDVREYPTITIKNEKKLGEIEFIKVDKDNKLLKLGATFELQEFNE
 DYKLYLPIKNNNSKVVTGENGKISYKDLKDGKYQLIEAVSPEDYQKITNKPILTFEVVKG
 IKNIIAVNKQISEYHEEGDKHLITNTHIPPKGIPKIGKILSFILIGGAMMSIAGGIYWKRY
 KKSSDMSIKKD

Oligos to be used:**Oligo GBS67pAMXbafor (vedi operone)**

AGTCAGTCTCTAGACGGCACAAATAGGAGTTGTAA

XbaI

Oligo GBS67soe1rev

GCAAGCTGCTATGCTTTGTAACGGCTTTTGTGTCCACT

Oligo GBS322soe2for

GACAAACAAAAGCCGTTAATAACAGATACCAAGCTGGACAG

Oligo GBS322soe2rev1 (per costruito non delete in 67)

GAGTACGAAGACAACATCTTGTAAATCATACGTCGAACG

Oligo GBS322soe2rev2 (per costruito delete in 67)

TAAAAAGTAACTCTCCCCCTTGTAAATCATACGTCGAACG

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Oligo fine67soe3for1 (per costruito non deleto in 67)

GACGTATCAATTAAACAAAGATGTTGTCTTCGTACTCGAT

Oligo fine67soe3for2 (per costruito non deleto in 67)

GACGTATCAATTAAACAAAGGGGAGAGTTACTTTTTATTTC

Oligo GBS67pAMBglrev (vedi operone)

CACCTGTCATAGATCTTAAGAATAC TAAAGCCGATAA

BgIII

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Figure 234 D

PCR Soe1: GBS67pAMXbafor + GBS67soe1rev 727 bp

PCR Soe2 non del: GBS322soe2for + GBS322soe2rev1 1260 bp

PCR Soe2 del: GBS322soe2for + GBS322soe2rev2 1260 bp

PCR Soe3 non del: fine67soe3for1 + GBS67pAMBglrev 2061 bp

PCR Soe3 del: fine67soe3for2 + GBS67pAMBglrev 1419 bp

PCR Soe4 non del. PCR25: GBS67pAMXbafor + GBS67pAMBglrev 4000 bp

Substrato PCRSoe1, 2, 3 non del

PCR Soe4 del, PCR26: GBS67pAMXbafor + GBS67pAMBglrev 3312 bp

Substrato PCRSoe1, 2, 3 del

4- Substitution of GBS 52 with a fusion of GBS322-GBS52 to include GBS 322 into AI-1

(same legend as for GBS67 derivatives)

a) Construct 1: GBS52 complete sequence included

b) Construct 2: Only part of GBS 52 was included (*deleted bold region*)**DETAILS:**

a) Construct 1:

>GBS322-52 senza delezione di 52 (B) PCR 24

MKMNKKVLLTSTMAASLLSVASVQAQETDTETWARTVSEVKADLMKODNK
 GSYTVKYGDITTSVISEAMSIDMNVLAKNINADINLIPETTLTVTYDQK
 SLTATSMKIETPATNAAGOTTATVDLKTNOVSVADQKVSINTISEGNTRE
 NATIIVSPMKTYSSAPALKSKEVLAGEQAVSQAAANEQVSPA
 PVKSIITSEVPAAKEELAKPTOTSVSQSTTVSPASVAAETPAPVAKVAPVRTVAAPRVAS
 MKVVTETKVEYGASPEHVSAPAVPVTTTSPATDSKLOATEVKSVPAQKAP
 EATPVAQPASTTNAAHPENAGLOPHVAAYKEKVASTYGVNEFSTYRAG
 DPQDHHGKGLAVDEIVGCTNQALGNKVAQYSTQNMANNISYMWQOKFYSN
 TNSIYGPAWTWNAMPDRCCVTANHYBH/VHVSFNK HQLTIVHLEARDIDRPNPQL
 EIAPKEGTPIEGVL YQLYQLKSTEDGDLAHWNSLTITELKKQAQQVFEA
 TTNQQGKATFNQLPDGIYYGLAVKAGEKNRNVSAFLVDLSEDKVIYPKII
 WSTGELDLLKVGVDGDTKKPLAGVVFELYEKNGRTPIRVKNGVHSQDIDA
 AKHLETDSSGHIRISGLIHGDYVLKEIETQSGYQIGQAETAVTIEKSKTV

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TVTIENTKKVPTPKVPSRGGLEKQQAMALVIIGGILIALALRLLSKH
RKHQNKD

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Figure 234 E

b) Construct 2:

>GBS322-52 (A) PCR 23

MKMNNKKVLLTSTMAASLLSVASVQAQETDITWTARTVSEVKADLVKODNK
 SSYTVKYGDTLSVISEAMSIDMNNVLAKINNIADINLIYPETTLTVTYDOK
 SHTATSMKIETPATNAAGOTTATVDLKTNQVSVADOKVSLNTISEGMTPE
 AATTIVSPMKTYSSAPALKCKEVLAEQAVSQAAAANEQVSPA
 RVKSTSEVPAAKEEYKPTQTSVSQSTTVSPASVAAETPAPVAKVAPVRTVAAPRVAS
 VKVVIKPKVETGASPEIIVSAPAVPVTTTSPATDSKLOATEVKSVPAQKAE
 IATPVAQPASTITNAVAHPENAGLOPHVAAYKEKVASTYGVNEFSTYRAG
 DPGDHGKGLAVDFIVGTNQAALGNKVAQYSTONMAANNISYVWQOKFYSN
 TNSLYCPANTWNAMPDRGGVTANHYDHVHVSENK
 QGKATFNQLPDGIYYGLAVKAGEKNRNVSAFLVDLSEDKVIYPKII
 WSTGELDLLKVGVDGDTKKPLAGVVFELYEKNRTPIRVKNGVHSQDIDA
 AKHLETDSSGHIRISGLIHGDYVLKEIETQSGYQIGQAETAVTIEKSKTV
 TVTIENKKVPTPKVPSRGGLEKIGEQQAMALVIIGGILIALRLLSKH
 RKHQNKD

Oligos to be used:

Oligo 322Aflfor1

AGTCAGTCCTTAAGGATATTATAGTCTCGGACTA

Afl II

Oligo 52 soe1 forA

CAAGGAAAGGCTACATTTAACG

Oligo 52 soe1 forB

CATCAGTTGACGATTGTTTCATC

Oligo52 soe1revA

AAATGTAGCCTTTCCTTGTTTAAATGATACGTTCAACG

Oligo52 soe1revB

AACAATCGTCAACTGATGTTTAAATGATACGTTCAACG

Oligo 52Xhorev

AAGACCTCCTCGAGATGGCACTT

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Xho I

PCR Soe1A: Oligo 322Aflfor1+ Oligo 52 soe1 revA 1370 bp

PCR Soe2A: Oligo52 soe1forA + Oligo 52Xhorev 520 bp

PCR Soe3A: Oligo 322Aflfor1 + Oligo 52Xhorev 1846 bp (con PCR Soe1A + PCR Soe2A)
(PCR23)

PCR Soe1B: Oligo 322Aflfor1+ Oligo 52 soe1 revB 1370 bp

PCR Soe2B: Oligo52 soe2forB + Oligo 52Xhorev 742 bp

PCR Soe3B: Oligo 322Aflfor1 + Oligo 52Xhorev 2068 bp (con PCR Soe1B + PCR Soe2B)
(PCR 24)

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Figure 235

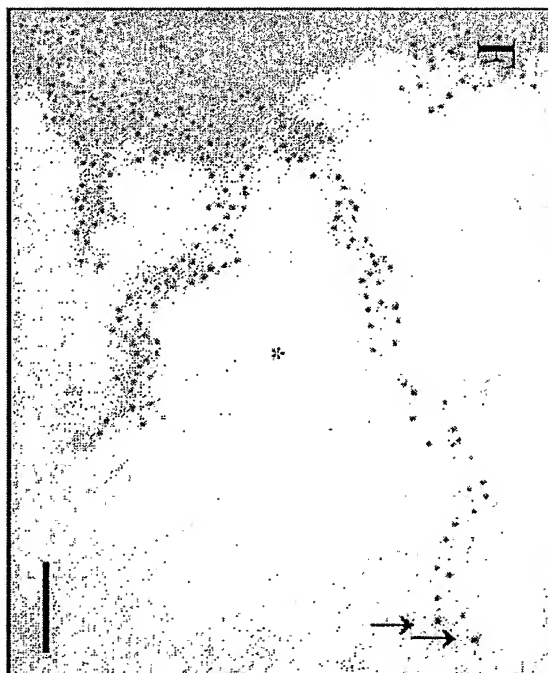


Figure 236



Strain variability - GBS67: 2 alleles

1 MRKYQKPSKIITLSLFCLSQIPLNTNVLGSEVPENGAKGLVVKTTDDQ 50
|||||
1 NVLGESTVPENGAKGLVVKTTDDQ 25
51 NKPLSKATFVLKTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAP 100
|||||
26 NKPLSKATFVLKTPSHSESKEVKVTEVTGEATFDNLTPGDYTLSEETAP 75
101 EGYKKTQVQVKNVSGNGKTTIQNSGDRNSTIGNQOEELDKQYPTGIYE 150
|||||
76 EGYKKTQVQVKNVSGNGKTTIQNSDDKKSIIIEQOEELDKQYPLTGAYE 125
151 DTKEYSKLEHVKGSPVNGKSEAKVNPYSSEGEHIREIPEGTILSKRISEV 200
|||||
126 DTKEYSKLEHVKNPSINGKLEAKVNPYSSEGEHIREIQEGLTILSKRISEV 175
201 GDLAHKKYIELTVSGKTIKVPYDQKPLDVVFLDNSNSMNDGNPQFOR 250
|||||
176 NDLDHKKYIELTVSGKSIKTIKNDKDEPLDVVFLDNSNSMKNNGKN... 222
251 HNKAKAAEALGTAVKDIILGANSNRAALVTYGSDFDGRSDVYVKGFE 300
|||||
223 .NKAKAGAEVETIKDVLGANVENRAALVTYGSDFDGRVTVKVGFE 271
301 DDXYGLQTFQTYQENYSHKQLTNNABEILKRIPEAPKAKWGTTNGL 350
|||||
272 .DPYGLTFTVQTDNDYSYKKFTNTAADIIKKIPKEAPEAKWGTTSLGL 320
351 TPEQKRYILSKYGEFTMKAFWEADDDILSQVNRNSQKLIHVHVDGVPTR 400
|||||
321 TPEKREYDILSKYGEFTMKAFWEADTILSSIQRSKRIIVHLDGVPTR 370
401 SYAINFKLGASVESQFQKKNNGYLNKSNFLLDKPEDIKNGESYFLF 450
|||||
371 SYAINSFVKGSTVANOFEIKGKGLDKNNYFLTDDEPKIKNGESYFLF 420

451 PLDSYQQTIIISGNLQKHLHYLDNLNYPKGTIYRNGPYKEHGTPTKLYINS 500
|||||
421 PLDSYQQTIIISGNLQKHLHYLDNLNYPKGTIYRNGPYKEHGTPTKLYINS 480
501 LKQKNYDIFNFGIDISGFRQVYNEEYKKNQDGTFOKLKEAFKLSDEGIT 550
|||||
471 LKQKNYDIFNFGIDISGFRQVYNEEYKKNQDGTFOKLKEAFKLSDEGIT 520
551 ELMRSFSKPEYYTPIVTSADTSNNNEILSKIQOQFETILTKEINSVNGTI 600
|||||
521 ELMRSFSKPEYYTPIVTSADTSNNNEILSKIQOQFETILTKEINSVNGTI 580
601 EDPMDKINLQNGQTLQPSDYTLQNGDGSVMKDGDIATGGPNDGGILK 650
|||||
571 EDPMDKINLHNGQTLQPSDYTLQNGDGSIMKDSIATGGPNDGGILK 620
651 GVKLEYIGNKLYVRGLNGLGEGQKVTLYDVKLDDSFISNKFYDTNGRTTL 700
|||||
621 GVKLEYIGNKLYVRGLNGLGEGQKVTLYDVKLDDSFISNKFYDTNGRTTL 670
701 NPKSEDPNLTLDFFPIKIRDVREYPTITIKNEKGLGEIEFIKYDKONNKL 750
|||||
671 NPKSEDPNLTLDFFPIKIRDVREYPTITIKNEKGLGEIEFIKYDKONNKL 720
751 LLKGATFELQEFNEDYKLYLPIKNNNSKVVTGNGKISYKDLKDGKYQLI 800
|||||
721 LLKGATFELQEFNEDYKLYLPIKNNNSKVVTGNGKISYKDLKDGKYQLI 770
801 EAVSPEDYQKITNKPILTTEVVKSGSIKNIIVANKQISEYHEEGDKHLITN 850
|||||
771 EAVSPEDYQKITNKPILTTEVVKSGSIKNIIVANKQISEYHEEGDKHLITN 820
851 THIPPKGIIIPMTGGKILSFILIGAMMSIAGGIYIWKRYKKSSDMSIKK 900
|||||
821 THIPPKGI..... 828

Differences
between strains
2603 and H36B
(AA not matching/AA
total and % of homology)

114 / 828 (87,1%)

Figure 237

Strain variability - GBS67 Allele I (2603)

Strain	Differences in comparison with 2603 (% of homology)
2603	-
18RS21	1/833 (99.9%)
CJB111	14/833 (98.3%)
515	2/833(99.8%)

Figure 238

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Strain variability - GBS67 Allele II (H36b)

Strain	Differences in comparison with H36b (% of homology)	FACS (α -67 from 2603)
H36B	-	444
1169	10/823 (98.8%)	443
090	9/316 Stop codon (8G to 7G)	0
CJB110	11/824 (98.7%)	245

Figure 239

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60/693,001	21 June 2005 (21.06.2005)	US
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(71) Applicant (for all designated States except US): **NOVARTIS VACCINES AND DIAGNOSTICS INC.** [US/US]; 4560 Horton Street, Emeryville, CA 9460-2916 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **TELFORD, John, L.** [IT/IT]; Chiron Vaccines, 1, Via Fiorentina Siena, I-Siena (IT). **GRANDI, Guido** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT). **LAUER, Peter** [US/US]; 1438 Milvia Street, Berkeley, CA 94709-1917 (US). **MORA, Marirosa** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT). **ROS, Immaculada, Margarit, Y.** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT). **MAIONE, Domenico** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT). **BENSI, Giuliano** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina,

I-53100 Siena (IT). **RINAUDO, Daniela** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT). **MASIGNANI, Vega** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT). **BAROCCHI, Michelle** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT). **RAPPULOI, Rino** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT).

(74) Agent: **HALE, Rebecca, M.**; Novartis Vaccines and Diagnostics Inc., P.O. Box 8097, Emeryville, CA 94662-8097 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

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(54) Title: IMMUNOGENIC COMPOSITIONS FOR GRAM POSITIVE BACTERIA SUCH AS STREPTOCOCCUS AGALACTIAE

(57) Abstract: The invention relates to the identification of a new adhesin islands within the genomes of several Group A and Group B Streptococcus serotypes and isolates. The adhesin islands are thought to encode surface proteins which are important in the bacteria's virulence. Thus, the adhesin island proteins of the invention may be used in immunogenic compositions for prophylactic or therapeutic immunization against GAS or GBS infection. For example, the invention may include an immunogenic composition comprising one or more of the discovered adhesin island proteins.

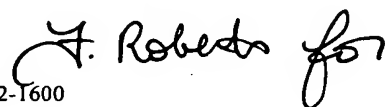


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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/27239

A. CLASSIFICATION OF SUBJECT MATTER IPC: A61K 39/02(2006.01) USPC: 424/190.1 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 424/190.1 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) MEDLINE, BIOSIS, HCAPLUS, EMBASE, DERWENT, PUBLISHED APPLICATIONS AND ISSUED PATENTS.		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/34771 A2 (TELFORD et al) 02 May 2002 (02.05.2002), see pages 1411 and 3057. (only the relevant pages provided)	1-7 and 17-24
X	LARSSON et al. Protection against experimental infection with group B streptococcus by immunization with a bivalent protein vaccine. Vaccine. February 1999, Vol. 17, No. 5, pages 454-458.	1-7 and 17-24
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"P"	document published prior to the international filing date but later than the priority date claimed	
Date of the actual completion of the international search 21 May 2008 (21.05.2008)		Date of mailing of the international search report 25 AUG 2008
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201		Authorized officer PADMA v. BASKAR Telephone No. 571-272-1600 

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/27239

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.: 1-7 and 17-24
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

- Remark on Protest**
- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

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BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

1. This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim 1 -7 (in part) drawn to an immunogenic composition comprising a purified Group B Streptococcus adhesion island polypeptide.

Further species election to one composition comprising GBS AI -1 or GBS AI -2 required (see paragraph # 3).

Group II, claims 8-16 (in part) drawn to an immunogenic composition comprising a purified gram positive adhesion island polypeptide.

Further species election to one composition comprising one bacteria and one GAS AI -1 ,GAS AI -2,GAS AI -3 and GAS AI -4 required (see paragraph # 3).

Group III, claims 17-24 (in part) drawn to an immunogenic composition comprising a first and second purified Group B Streptococcus adhesion island polypeptide.

Further species election to one combination of first and second polypeptide (see paragraph # 3).

Group IV, claims 25-34 (in part) drawn to an immunogenic composition comprising a first and second gram positive GAS AI -adhesion island polypeptide.

Further species election to one combination of first and second polypeptide (see paragraph # 3).

Group V, claims 35-39 and 40 (in part) drawn to a modified gram positive bacterium and a method of manufacturing adhesion island antigen

Further species election to one modified gram positive bacterium required (see paragraph # 3).

Group I is directed to an immunogenic composition comprising polypeptide GBS AI -1 or GBS AI -2 whereas Group II is drawn to immunogenic composition comprising gram positive bacterial adhesion polypeptides GAS AI -1 , GAS AI -2 , GAS AI -3 and GAS AI -4 . These inventions are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1 because these two compositions do not share a common structure ,property and function as group I contains GBS polypeptide where as group II comprises GAS polypeptides . Group III and Group IV are also drawn to compositions as group III comprises combination of two polypeptides from GBS that shares no common structure ,property and function with Group IV as it comprises GAS polypeptide and thus do not share a single inventive concept. Thus these inventions are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1 Group V is drawn to a modified bacterium from GBS , GAS and non-pathogenic gram positive bacterium comprising expressing polypeptide GBS- AI -1or GBS-AI-2 and not share a single inventive concept from other four groups as the composition contains polypeptides which does not share a common structure, property and function.

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2. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for more than one species to be examined, the appropriate additional examination fees must be paid. The species are as follows:

3 Group I species: GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524 or GBS AI -2

Group II species: GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4.

Group III species: Any combination of first and second polypeptide from GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI -2.

Group IV species: Any combination of first and second polypeptide from GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4

Group V species: Modified gram-positive bacterium or non pathogenic bacterium expressing GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI -2, GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4

The inventions listed as Groups 1-5 do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The technical feature of linking groups appears to be that they are all related to immunogenic compositions comprising adhesion peptides methods of making adhesion peptide.

However, Beckmann et al Infection and Immunity, June 2002, p. 2869-2876, Vol. 70, No. 6 disclose an immunogenic composition comprising adhesion oligomeric polypeptide (see page 2871, left column last paragraph through right column and figure 3) As this polypeptide binds to fibrinogen it is an adhesion immunogen. Therefore, the technical feature of linking groups 1-5 does not constitute a special technical feature as defined by PCT Rule 13.2, as it does not define a contribution over the prior art and hence unity of invention is lacking.

The special technical feature of Groups 1-5 is considered to be immunogenic compositions comprising polypeptides that share no common structure, property and function and thus do not share the same or a corresponding technical feature.

Accordingly, Groups 1-5 are not so linked by the same or a corresponding special technical feature as to form a single general inventive concept.

The claimed species GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI -2; GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4 have no common structure and thus are not linked by the same or a corresponding special technical feature so as to form a single general inventive concept under Rule 13.1. Hence, unity is lacking among species.